FOOD INDUSTRIES

● FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

OCTOBER 1943

How To Go After An Army Order

Model Food Plant Designed

Dehydration by Infrared Tested

Processing and Uses of Chicory

A Food Plant With New Ideas

Meeting the Problem of Safety

Dual-Process Freezing Plant

McGRAW-HILL PUBLICATION

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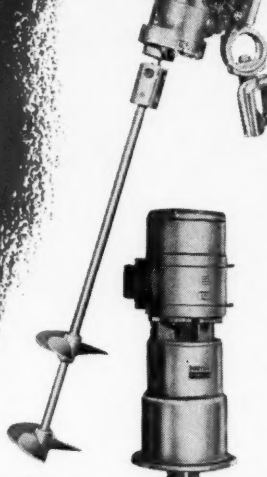

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(Left)

PORTER
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Installing PORTER MIXERS is like adding to your present tank capacity—batches are completed in less time and tanks are released for re-charging more often in the same length of time.

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THE COVER

Taken in an egg dehydrating plant, the picture on the cover shows the bottom of the conical chamber in which the eggs, after mixing, are dried in a current of hot air. The egg mixture is sprayed in at the top of the cone and falls to the bottom as a powder, being carried away by the screw conveyor in the inclined trough beside the workman. Two agitating vats on either side of the cone accommodate the eggs between the mixing and spraying operations. *(Photo by Three Lions)*

Also on the cover is the official emblem of the "Food Fights for Freedom" campaign.

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★ ★ ★ **CHANGE OF ADDRESS** ★ ★ ★

McGRAW-HILL PUBLISHING COMPANY
330 West 42nd Street, New York 18, N. Y.
Director of Circulation:

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From .....

.....

To .....

.....

Signed .....

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POST-WAR PLANNING...
ALL THIS TALK ABOUT NEW
REFRIGERATING METHODS...
SAY, LISTEN! NEW EQUIPMENT
WILL BE OUR PROBLEM

NOT WITH
WORTHINGTON ON THE
JOB...LOOK ON
THE BRIGHTER SIDE

GOOD IDEA...Let's Look on the Brighter Side

For example—the post-war mass market of 135,000,000 people in the resurgent movement from meatless, poultryless, pointless days to the bountifully provisioned home tables. When the economic squeeze is relaxed, food prohibition is over —when supply, distribution and service are all in gear again.

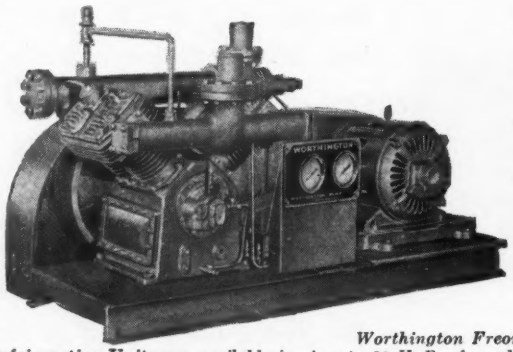
Another example in the planning stage NOW—a cool *half billion dollars* already set aside by management for new restaurant construction and remodeling — delightful, de luxe places to eat, with Air Conditioning.

On the supplier's side, it's a picture bright with promise of big business. It's going to mean refrigeration with a big "R". Not the outmoded type, but new designs and new methods—streamlined for economical operation from the word "GO".

And Worthington will be ready. Because of our part in the war program, we've gained a vast new fund of knowledge about refrigeration and air conditioning. And all of it is in new designs on the drawing board. For discussion *now*—for delivery *then*. Let's talk it over.

Oh, yes! About your immediate problems. If you need help on maintenance and repair parts, let us know. We're never too busy to give a hand. **Worthington Pump and Machinery Corporation,** Harrison, N. J. Offices also in Principal Cities.

CA 3-37



Worthington Freon Refrigeration Units are available in sizes to 50 H. P.—for cold storage, low temperature freezer duty, or for air conditioning.

WORTHINGTON

Refrigeration

AND AIR CONDITIONING

FOOD INDUSTRIES is published monthly. Price 35c per copy. Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, Food Industries, 330 West 42nd St., New York, N. Y. Subscription rates: United States and Possessions, Mexico, Central and South American countries, $3 a year, $4 for two years, $5 for three years. Canada, $3.50 a year; $5 for two years; $6 for three years (payable in Canadian or U. S. Funds). Great Britain and British possessions, 30 shillings for one year, 60 shillings for three years. All other countries, $5 a year, $8 for two years, $10 for three years. Entered as second-class matter, Aug. 17, 1936, at Post Office, Albany, N. Y., under act of March 3, 1879.

How to connect GLASS PIPING to your present equipment

It is easy to connect glass piping to any pipe line, valve, pump or tank in your plant. If you have hesitated about installing a trial piece of glass piping or a short line because of the possible difficulty of making a tight joint with your present equipment, here is the answer to your problem.

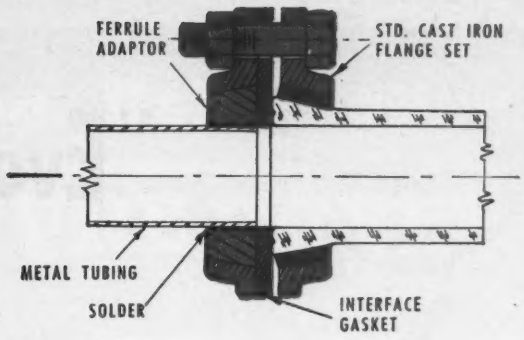
Use the proper adaptor flanges, drawings of which are shown herewith. You can now purchase these standard stock adaptor flanges to connect Pyrex piping directly to:

STEEL	PORCELAIN
CAST IRON	GLASS-LINED PIPE
LEAD	HARD RUBBER
STAINLESS	RUBBER-LINED METAL

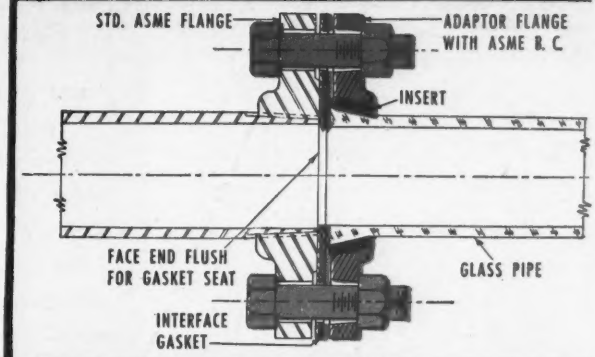
With these adaptor fittings it is a simple matter to discover to your own satisfaction just where you can profitably use PYREX piping—places where you can take advantage of its remarkable resistance to all acids and alkalies (except HF), resistance to abrasive action of slurries and gritty particles, and its ability to withstand thermal shock. Its crystal-clear transparency and its long life and reasonable cost may mean that it is the best piping for that line which has been giving you trouble. Here at Corning our research facilities have helped to find the answers to many troublesome piping problems. Corning engineers offer you the benefits of this experience. Send in the coupon or write to the Industrial Division, Corning Glass Works, Corning, N. Y.

"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works, Corning, N. Y.

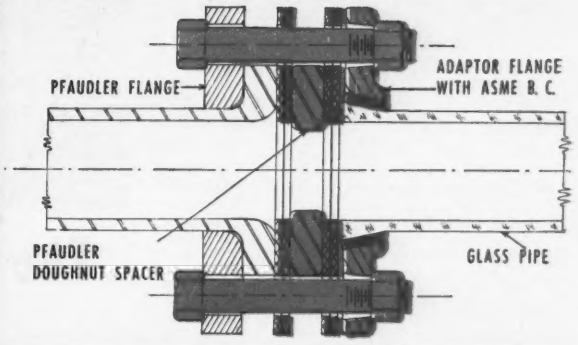
CORNING Glass Works Corning, New York — *Pyrex Industrial Glass*



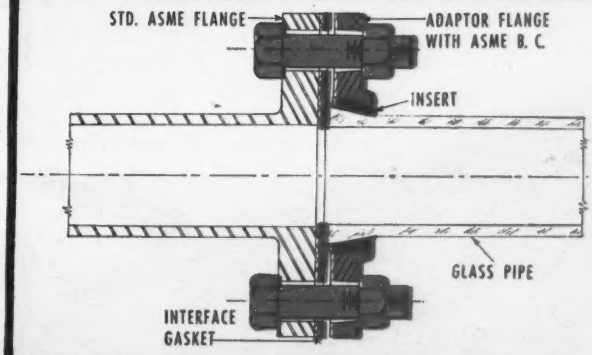
Connection to metal tubing



Connection to A.S.M.E. screwed flange



Connection to Pfaudler enamel-lined



Connection to A.S.M.E. flanged fitting

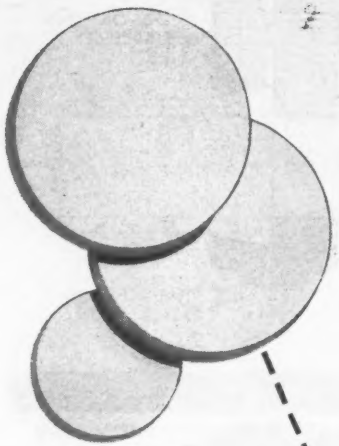
*Accessory parts in red furnished by Corning

Corning Glass Works, Industrial Division, Dept. FI
Corning, New York

Gentlemen: I would like glass piping information immediately on the subjects I have checked below. I understand there is no obligation.

☐ Installation Manual ☐ PYREX Valves
☐ PYREX Piping and Heat Exchangers ☐ Adaptors

Name.....
Firm.....
Street.....
City and State.....



"Even by small things are great ends helped"

FOR EXAMPLE, THESE LITTLE BLOW-OUT PLUGS OF GARDNER-RICHARDSON PAPERBOARD HELP AIRPLANE MACHINE GUNS FIRE DEADLIER LOADS

ON EVERY war front, you'll find Gardner-Richardson paperboard performing many important *big* jobs—protecting ammunition, food, medical, and ordnance supplies. You'll find it doing many important *little* jobs, too—such as protecting airplane machine guns from rust and dust.

Because ingenious little blow-out plugs, made of Gardner-Richardson paperboard, are inserted into the muzzle, the bore is kept clean as a whistle—the gun is in prime condition to fire a load of hot metal when a Messerschmitt or Zero gets into range.

Gardner-Richardson paperboard products are also doing a job on the home front—saving vital war materials, helping maintain the flow of essential civilian goods. In the Gardner-Richardson plants—in our research laboratories, development and designing departments—there is but one purpose so long as the war lasts: *to produce paperboard, cartons, and containers that will help speed the day of victory.*

The GARDNER-RICHARDSON Co.

Manufacturers of Folding Cartons and Boxboard

MIDDLETOWN, OHIO

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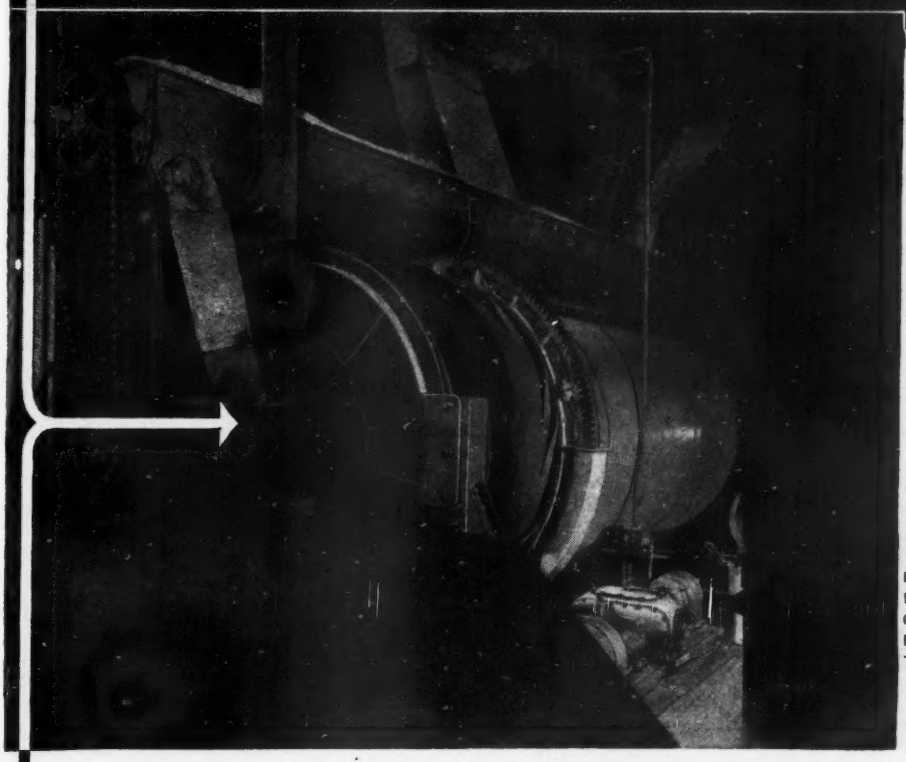
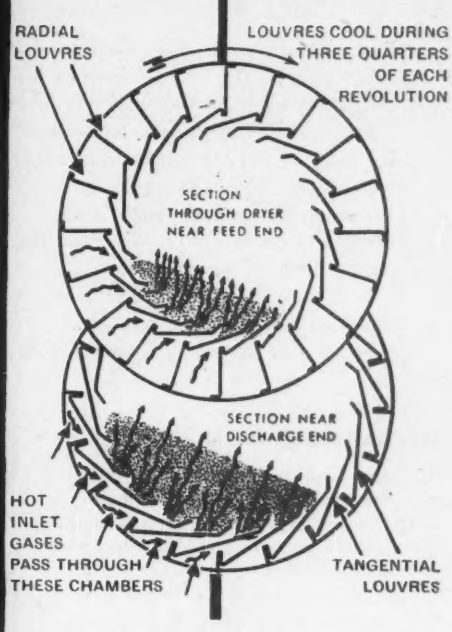
Accurate Uniform Drying... Dehydration

With the ROTO-LOUVRE DRYER



Link-Belt Roto-Louvre Dryer, now doing very satisfactory job of dehydrating soy bean meal prior to extraction of oil. Products previously dried in this machine include copra meal, ground apricot kernels, and mustard seed.


RADIAL LOUVRES
LOUVRES COOL DURING THREE QUARTERS OF EACH REVOLUTION
SECTION THROUGH DRYER NEAR FEED END
SECTION NEAR DISCHARGE END
HOT INLET GASES PASS THROUGH THESE CHAMBERS
TANGENTIAL LOUVRES

A large volume of dry hot air easily penetrates the relatively thin bed of material near the feed end of the dryer for maximum heat transfer where greatest evaporation can take place. As the material moves forward the bed becomes thicker and the air passages get smaller so that a reduced volume of heated air will penetrate the bed—thus preventing overheating.

DRIES UNIFORMLY—every particle of material is subjected to the same uniform treatment, eliminating "spotty" results.

HANDLES GENTLY—the Roto-Louvre design entirely eliminates cascading and avalanching—gentle rolling action preserves the desired form of material.

MINIMIZES "DUSTING"—the Roto-Louvre Dryer gives you "continuous aerated mass drying" which retains material in a compact bed yet exposes every particle to intimate contact with the transfer medium.

BUILT FOR SERVICE—no moving parts within the dryer shell—nothing to get out of order—longer service life—keeps maintenance and repair costs low.

NO OVERHEATING—highly heat-sensitive materials are exposed to an efficient high-temperature transfer medium without overheating—thermal input is reduced automatically to prevent a surplus of heat from raising the temperature.

HIGH EFFICIENCY—you get maximum vaporization and prompt removal of the moisture-laden exhaust gases.

OCCUPIES SMALL SPACE—often less than 50% of the floor space is needed over that of conventional-type drying equipment of comparable capacity.

SEND FOR THIS BOOK!

This informative Engineering Data Book, No. 1911, has been prepared by engineers who know drying problems such as yours. Address:

LINK-BELT COMPANY

300 W. Pershing Road, Chicago
Indianapolis, Philadelphia, Atlanta, Dallas
San Francisco, Toronto

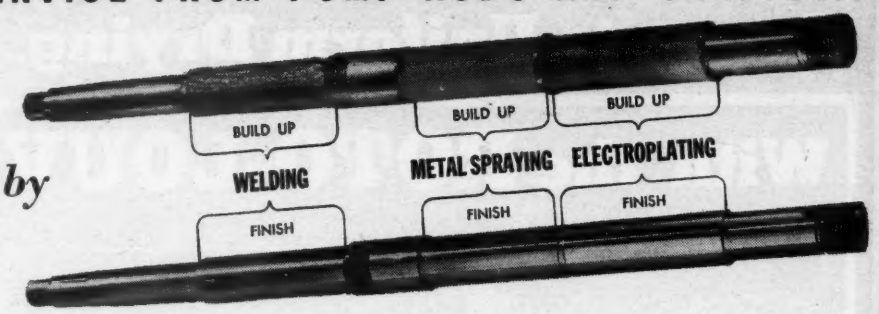
9198

LINK-BELT ROTO-LOUVRE HEAT DRYER

HOW TO GET MORE SERVICE FROM PUMP RODS AND SHAFTS...

PART 2–

Re-conditioning by building up and finishing



Putting worn pump rods, shafts and wearing sleeves back into shape usually may be done by machining and refinishing, as described in Part 1 of this series last month.

However, if too much metal must be removed to clean up the worn section, the shaft may be unduly weakened.

If a shaft shows a tendency to "whip"...or if a reciprocating pump rod tends to "bow" on pressure strokes, the pump manufacturer should be consulted. He may advise building up the shaft before machining.

If so, a choice may be made from three methods: *welding, metal spraying, or electroplating.*

Space does not permit a complete description of these operations, but the advantages of each method are given below.

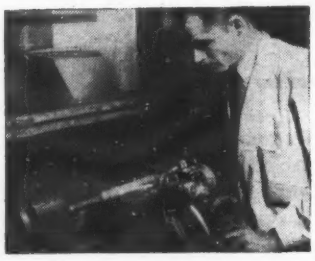
Rods and shafts of Monel or "K" Monel can be built up for re-finishing by the methods given here. The excellent mechanical properties of the Monels provide an extra margin of strength, rigidity and toughness beyond the ordinary demands of normal work.

A bulletin, "New Parts from Old," that includes complete information on the above operations, together with the method of reconditioning by machining and refinishing described previously, will be sent on request.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street **New York, N. Y.**

ADVANTAGES OF WELDING

This method produces a stronger, tougher, more rigid shaft or rod than does spray coating or electroplating... and the mechanical properties of the rebuilt-by-welding shaft closely approach the mechanical properties of the original. Electric arc welding is preferred and the equipment required will be found in almost any maintenance shop.

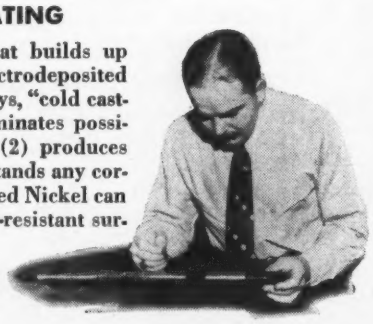


ADVANTAGES OF SPRAY COATING

This is the simplest method of the three. For some purposes, the peculiar, porous structure of sprayed metal coatings is a drawback; it adds little tensile strength or toughness. However, in many shaft applications, this porosity is considered a virtue...the pores fill with lubricant in service which is believed to account for the increased working life of the part.

ADVANTAGES OF ELECTROPLATING

Another method is "cold casting" that builds up worn parts with heavy coatings of electrodeposited nickel. Although slower than other ways, "cold casting" offers these advantages: (1) eliminates possibility of heat distortion and warpage. (2) produces a dense fine-grained deposit that withstands any corrosive condition under which solid rolled Nickel can be used. (3) makes an extremely wear-resistant surface, as the hardness of the plating can be controlled to develop tempers ranging up to several times the hardness of the original pump rod or shaft.



SUGGESTIONS FOR OPERATING PUMPS TO PROLONG LIFE OF RODS AND SHAFTS

Use a good quality of packing recommended by a good packing manufacturer for the particular type of service.

•

Before putting in new packing, make sure that every particle of the old packing is cleaned out.

•

Tighten up the packing gland evenly, back off the nuts two or three turns, and adjust them finger tight.*

•

Make sure that the gland followers do not ride on the piston rods or impeller shaft.

•

To prevent burning of the packing and scoring of the shaft or sleeves in a centrifugal pump, a small amount of water should always seep out through the stuffing box while the pump is running.

•

Two ways to make packing last longer in centrifugal pumps are to use a light grease on the new packing and to cool the stuffing box externally until the packing is "run in" and some sealing water leaks through the box.

•

When packing becomes hard and dry, do not attempt to stop excessive leakage by tightening up further on the gland. Replace packing immediately.

•

*Finger-tight is tight enough as long as the shaft or rod remains smooth and perfectly cylindrical. Shafts and rods of Monel or "K" Monel—with their qualities of high resistance to both corrosion and wear—tend to stay smooth and perfectly cylindrical longer.

★ ★ ★ ★ ★ **INCO NICKEL ALLOYS** ★ ★ ★ ★ ★

MONEL • "K" MONEL • "S" MONEL • "R" MONEL • "KR" MONEL • INCONEL • "Z" NICKEL • NICKEL

Sheet...Strip...Rod...Tubing...Wire...Castings

buy more
war bonds

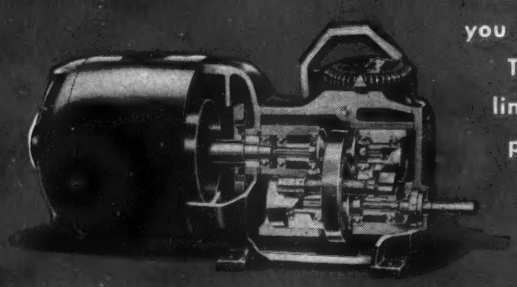
MASTER SPEEDRANGERS

On many applications, variable speed operation offers tremendous advantages. Thousands of alert engineers, like you, have found that the Master Speedranger provides this infinitely variable speed in a compact, all metal unit of proven reliability.

For example, each of the machines shown above use three Master Speedrangers which, in addition to providing the most advantageous speeds, have added greatly to the flexibility, compactness, economy and appearance of the machine.

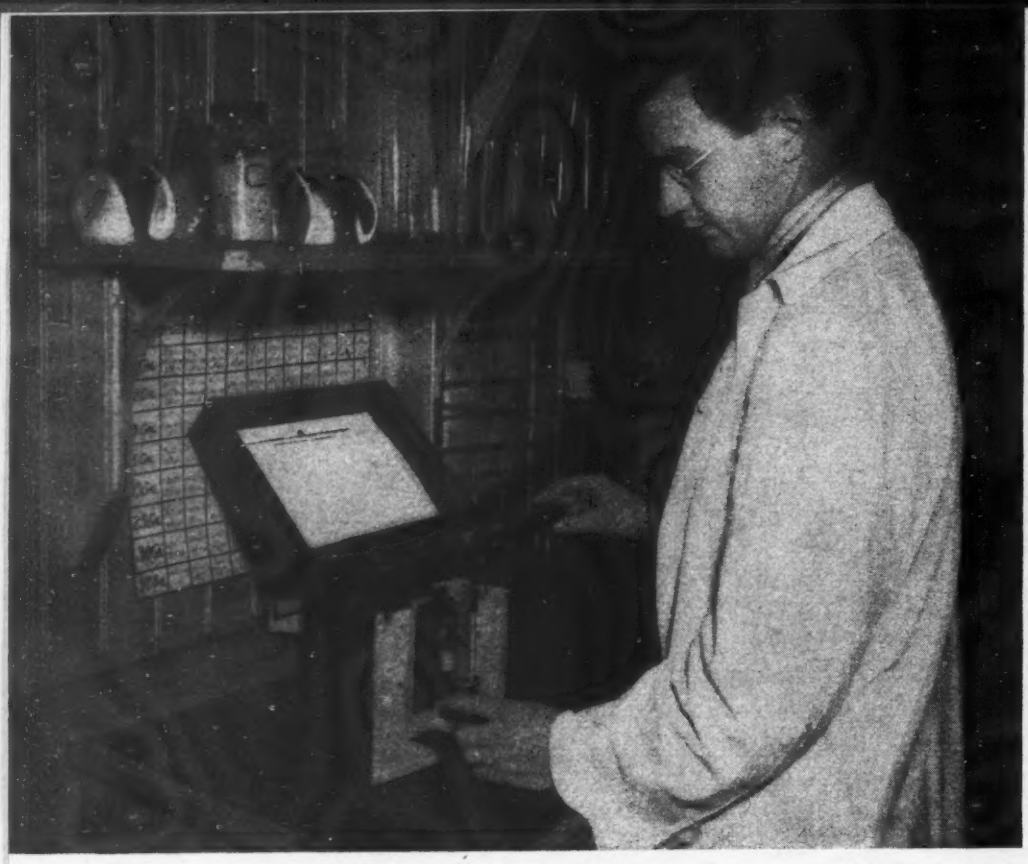
The Speedranger, on the drive unit on this application, incorporates also a gear reduction unit and an electric brake . . . all designed and built by one manufacturer as an integral, compact power unit. Furthermore, the Speedranger can be supplied in enclosed, splash proof, fan cooled or explosion proof construction, and for flange mounting, or with its construction modified so that the mounting possibilities are practically unlimited.

No other variable speed unit on the market today can give you such flexibility and compactness.



The next time you need a drive for material processing, handling and conveying equipment; mixers and agitators; welding positioners; machine tool drives; testing and calibrating equipment . . . to name only a few . . . see what a really remarkable job Master Speedrangers can do for you.

THE MASTER ELECTRIC COMPANY • DAYTON, OHIO



Scientist measuring pH in high-temperature, high-humidity atmosphere of a greenhouse at Ohio State University.

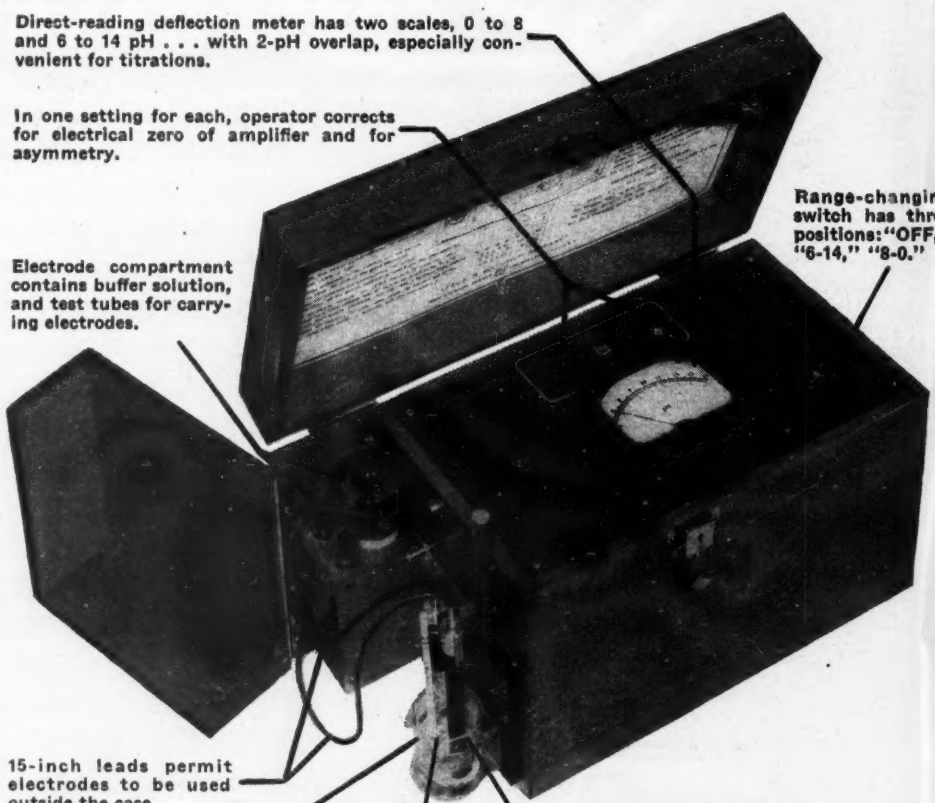
pH Checked Reliably In Hot, Humid Labs

Here are two pH Indicators designed especially for easy, trouble-free, accurate use even when relative humidity is as high as 95, with ambient temperature at 30 C. The two instruments differ only in their versatility and accuracy of adjustment; both are built to the same high standard of dependability.

The instrument shown in use is our Universal pH Indicator. In the application illustrated, it is being employed with its own self-contained glass measuring electrode, supplied with the Indicator. The instrument can, however, be used with quinhydrone, hydrogen or any other Nernst-equation measuring electrode supplied by the user, and is direct-reading in pH with *any* of them. The Indicator is thus especially useful when comparing the results of different electrodes on the same solution, or in any other condition where an all-around instrument is desired. Other features adapt this Indicator to the measurement of oxidation-reduction potentials as in titrating; it is read directly in volts in such work. The present model has a limit of error of adjustment of ±0.0037 volt or ±0.05 pH, exclusive of any error in the stated pH of buffer solution, and its reproduceability of reading is 0.02 pH. It can use samples as small as 2 ml in volume. At $240.00 it is an outstanding value for accuracy, versatility and high-grade construction.

The instrument below is our Glass-Electrode pH Indicator, specialized for use with this measuring electrode and a calomel reference electrode. Both are sealed at the factory and require only an occasional external cleaning. This cleaning, together with an equally occasional filling of the salt-bridge and replacement of dry cells, constitute the Indicator's maintenance needs.

There are two ranges; 0-8 pH and 6-14 pH; the 2 pH overlap is especially convenient for titrations. The limit of error of adjustment is ±0.1 pH, exclusive of course of error in stated pH of buffer solution. At $160.00 it is widely used because of its simplicity, speed, convenience and dependability.


Direct-reading deflection meter has two scales, 0 to 8 and 6 to 14 pH . . . with 2-pH overlap, especially convenient for titrations.
In one setting for each, operator corrects for electrical zero of amplifier and for asymmetry.
Range-changing switch has three positions: "OFF," "6-14," "8-0."
Electrode compartment contains buffer solution, and test tubes for carrying electrodes.
15-inch leads permit electrodes to be used outside the case.
Standard 50-ml beaker is self-aligning; held firmly in place by metal clips.
Thermometer facilitates setting of temperature compensator.
Small, rugged, sealed glass electrode and factory-filled reference electrode, both of high stability . . . self-aligning to prevent breakage.

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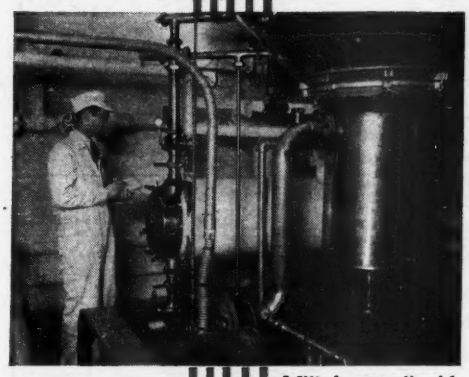
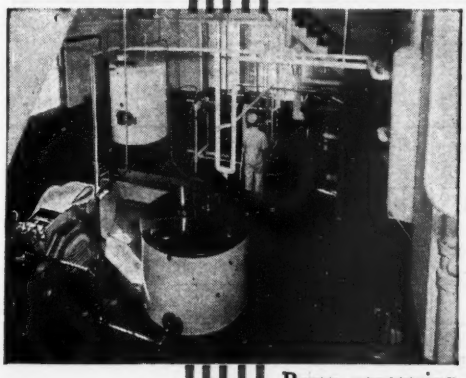
Jrl Ad E-96R-460(2a)

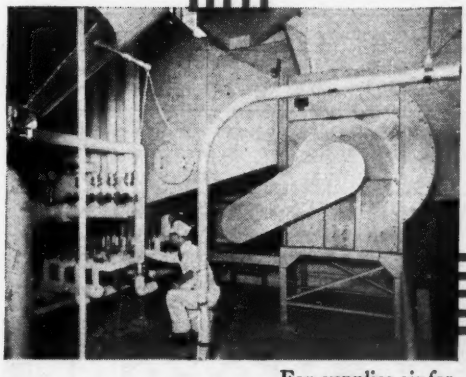
One Factor Dominates the Efficiency of Drying Equipment . . . ENGINEERING



Milk heater, liquid collector, and pump



Pump, processing tank, cooling vats

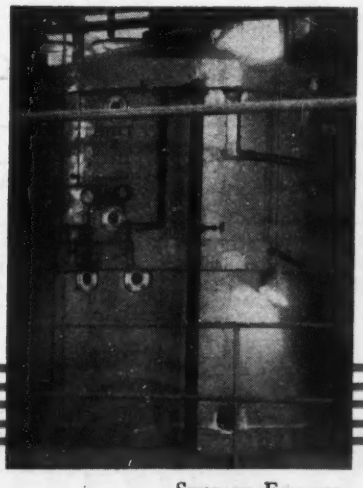


Fan supplies air for drying chamber

THE comprehensive engineering service now offered by Douthitt Gray-Jensen permits thorough analysis of every detail affecting the success of your food drying operations. With Swenson resources added to those of Douthitt, you can now obtain equipment backed by engineering knowledge and experience gained in two complementary fields. For nearly sixty years Swenson has been the nation's foremost builder of evaporation equipment, while Douthitt has been a leader for more than two decades in spray-drying equipment.

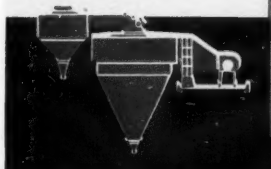
The most efficient operating results . . . possible only when units are specially engineered to meet individual requirements . . . are assured by the Douthitt Gray-Jensen six-way service:

1. Analysis of Requirements
2. Design and Layout
3. Manufacture of Equipment
4. Installation
5. Test Operation
6. Periodic Checkups



Swenson Evaporator, FC Type

Douthitt Gray-Jensen Spray Dryer



DOUTHITT GRAY-JENSEN

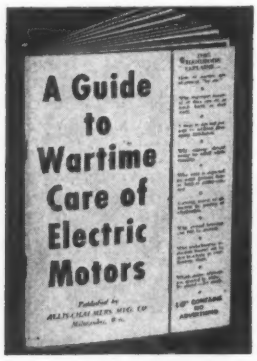
SWENSON EVAPORATOR CO. DIVISION of WHITING CORPORATION

221 No. La Salle St., Chicago 1, Ill., U. S. A.

FIRST AID FOR MOTORS

MOTORS RUN A FEVER? No wonder if they do more often today. They're working *3 and 4 times* as many hours as in peace!

Wartime conditions demand you diagnose motor ailments *quickly* . . . remedy the trouble at once. At right are but few of the many diagnoses found in Allis-Chalmers' new "Guide to Wartime Care of Electric Motors". In maintenance as in war, *attack is the best defense.* This book singles out the 9 main enemies of electric motors . . . tells you how to get them *before* they get your motors!



Over 100,000 copies already in use.

Write today for your *free* copy. ALLIS-CHALMERS MFG. CO., MILWAUKEE 1, WIS.

SYMPTOMS YOU CAN SEE

Symptom	Possible Causes	Cure
1. Excessive sparking or flashing at brushes. Blackened commutator.	Rough commutator.	Sand or turn down, depending upon depth of surface roughness.
	Low bar on commutator.	Grind or turn down balance of commutator.
	High bar on commutator.	If extreme, lower with mallet, tightening clamping ring. Grind true.
	Brushes too short.	Replace with harder grade—if worn too soon . . . and not by rough commutator.
	Shorted armature winding.	Test for short—after removing metallic contact between commutator bars. Repair.
2. Intermittent sparking at brushes.	Open armature winding.	Locate and replace bad coil—or repair defective joint.
3. Motor won't start.	Usually line trouble.	Correct. Check source of power supply.
	Load too heavy. See if motor runs without load.	Reduce load—or replace motor with unit of greater capacity.

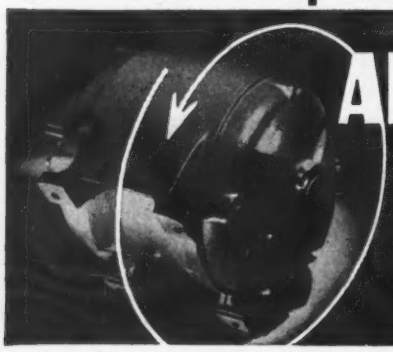
SYMPTOMS YOU CAN HEAR

4. Excessive hum.	Uneven air gap. Measure with feelers.	Replace bearings—before introduction of scraping noise indicates rotor is rubbing.
	Unbalanced rotor. Check on parallel bars.	Balance with solder on band—or weight attached by cap screw and lock washer.
5. Regular clicking.	Matter in air gap.	Take out rotor; remove matter.
6. Rapid knocking	Misalignment.	Realign set until knocking disappears.
7. Brush "chatter."	Extreme vibration.	See item 10, below.

SYMPTOMS YOU CAN FEEL

8. Vibration.	Misalignment.	Realign set.
	Vibration in driven machine.	Eliminate source in machine, if possible. Or a flexible belt drive may be in order.
9. Motor overheating. (Check with thermometer—don't depend on hand).	Overload. Measure load; compare with nameplate rating.	Check for excessive friction in motor, drive or machine. Reduce load, or replace motor with greater capacity unit.
	Dirt in motor. Check flow of air.	Blow out motor. Use solvent on wound section if necessary.
	Rotor rubs stator.	Replace bearings.

A 1638



ALLIS-CHALMERS MOTORS

When you do need new motors, look into the strength, solidity and all-around protection of the new "Safety Circle"—protected top, sides, ends and bottom.

AC WE WORK FOR VICTORY WE PLAN FOR PEACE

"Gimme a bag of Lemon Juice, too"

Yes—lemon juice in a BAG! "*Just add water and serve.*"

Almost every day modern food processing pulls a new miracle out of the hat. Fruit juices in powdered form; fresh carrots like tiny chips of gold; a pound of meat that would fit in a watch case; beverages like lozenges—Mamma may bring home the full supply of week-end groceries in her purse.

These and other "what-will-they-do-next?" developments are made practical in part, by the equally startling developments of engineered packaging.

Capturing and holding the delicate fresh-from-the-fruit flavor of the lemon is the by no means simple task of this innocent looking package. It's *"TRITECT" laminated cellophane, loaded and sealed on Trans-Wrap equipment—another development of Dobeckmun specialists.

Lemon Juice Powder Synthetic
Net Weight ¼ oz. (7 gm.)
A mixture of dried pure lemon juice with corn syrup, dextrose, citric acid, ascorbic acid and oil of lemon.
Dissolve contents in ⅔ canteen cup cold water. Add sugar and stir well.
Mfd. by ETTAKO FLAVOR TORTISE, 1943.
Component U. S. Army Field Ration K & C

YES, ENGINEERED PACKAGING!

For years, Dobeckmun has researched and engineered advanced packaging techniques and materials. The first cigar tubes—the first laminated pull-tape opener—the first machine-made cellophane bag—the first practical joining of film and foil and the most satisfactory lacquer and plastic coatings for packages!

Right now, Dobeckmun specialists are solving war product packaging problems. But they are also ready to tackle the anticipated problems of peacetime packaging with foresighted experience.

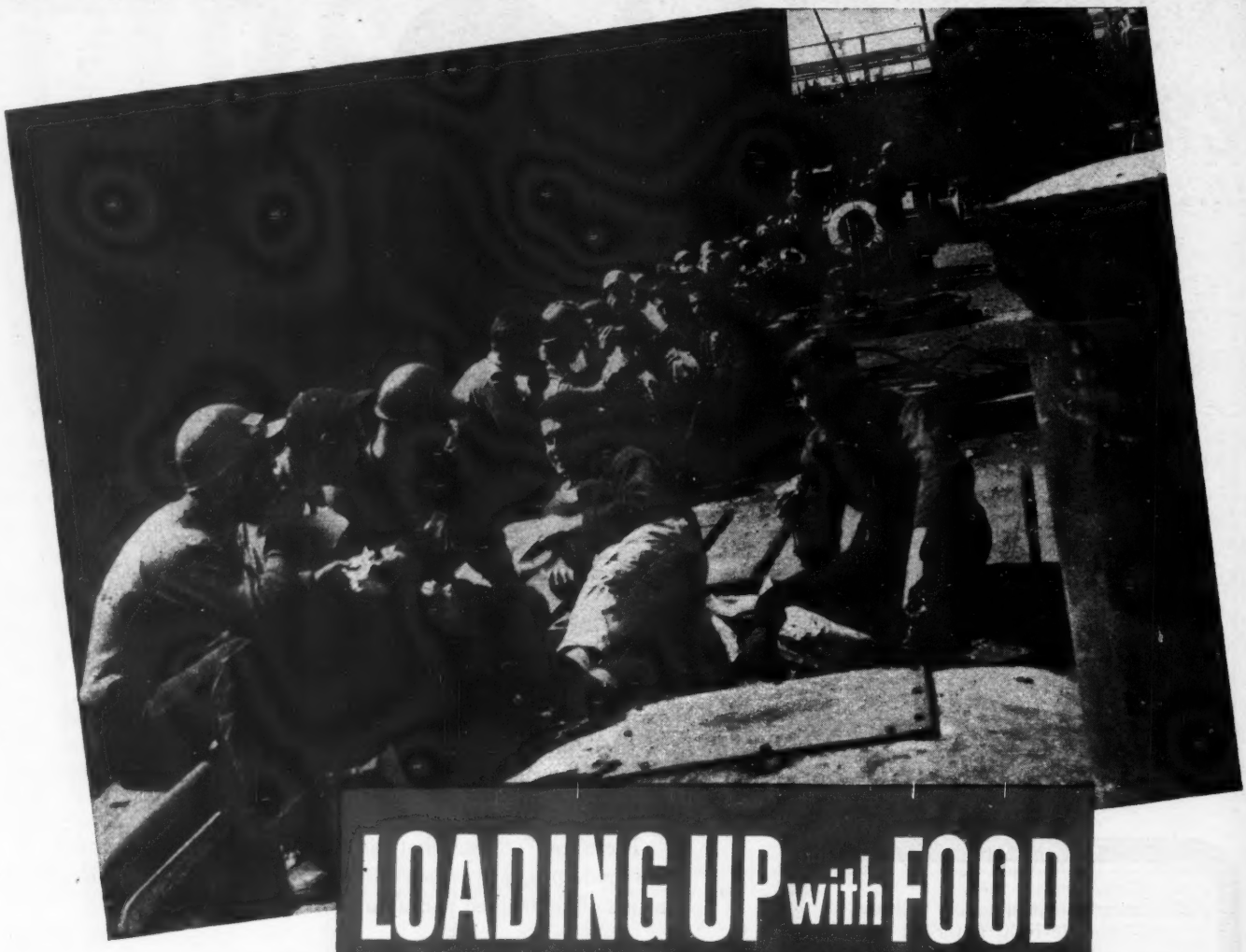
If you have an interest in this subject, can't we talk it over now?

*Similar hygrostatic products may be packed in Dobeckmun heat sealing, laminated foil.

THE DOBECKMUN COMPANY

CLEVELAND, OHIO · OAKLAND, CAL

AN AMERICAN INSTITUTION WORKING WITH AND FOR AMERICA



LOADING UP with FOOD
AMERICA'S GREATEST WEAPON

These fighters on the homefront are taking a well earned recess to stoke-up for another "go" at the strenuous job ahead. Workers in our war plants, subjected to exacting effort and nerve-shattering machines, pay heavy toll in loss of physical stamina. To replenish reservoirs of energy, adequate nutrition is a national "must." Flavorful food of appetizing freshness is essential to America's fighters everywhere. The time interval between production, processing, storage and consumption of edibles demands that invulnerable protective packaging be employed. Otherwise these "saboteurs"—Waste, Spoilage and Contamination will move in. To the cause of food protection, we bring perfected products that are the result of years of close association with the food packaging needs of the Nation. Rhinelander's protective papers are on the job for the duration—and thereafter.

RHINELANDER
PROTECTIVE PACKAGING
Papers

FROM THE BEST THAT'S MADE TO THE CHEAPEST THAT'S GOOD

Genuine Greaseproof
Coffee Bag Papers
Confectionery Papers

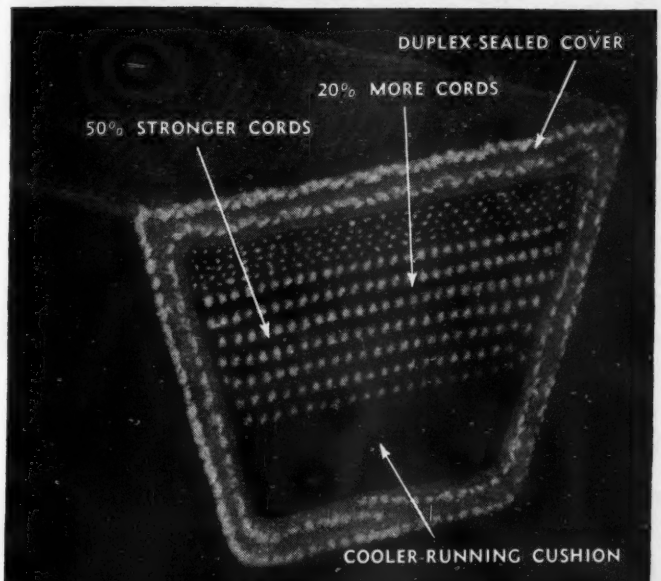
Cereal Wrapping Papers
Laminated Greaseproof Papers
Lard and Shortening Liners

Bakery Product Wraps
Cracker Box Liners
Greaseproof Innerwraps

Wax Laminated Glassine
Opaque Label & Bag Glassine
Packing Industry Wrappings

RHINELANDER PAPER COMPANY • MILLS AT RHINELANDER, WISCONSIN, U.S.A.

HOW TO Give V-Belt Wear the new "One-Two"!



1

BUY THE BEST BELTS...

You're 'way ahead of maintenance worries when you get the new Texrope Super-7, with revolutionary design-against-wear. 20% *more* cords — special-treated by the new Flexon process to make them 50% *stronger* — fight stretch. A cool-running rubber cushion "floats" cords around sheaves. Duplex-Sealed cover guards belt against grit, grime, moisture. When you *do* need new V-belts *invest in the best* — Texrope Super-7!

2

USE THE BEST CARE...

Want to make your present belts last *longer?* You can, no matter what brand you're using. Allis-Chalmers' new handbook: "Plain Facts on Wartime Care of Rubber V-Belts", gives you the "know-how" with tips on *what determines V-belt life expectancy... good rule-of-thumb for tension* ...and a lot more. It's jam-packed with valuable data — ideal for training new men. Tear off the coupon below and send for your *free* copy... today.

ALLIS-CHALMERS

TEXROPE SUPER-7 V-BELTS

WE WORK FOR VICTORY — WE PLAN FOR PEACE

Trade mark registered U. S. Patent Office. Texrope Super-7 V-Belts are the result of the cooperative research and design genius of two great companies—Allis-Chalmers and B. F. Goodrich—and are sold exclusively by Allis-Chalmers. Available in all sizes.

ALLIS-CHALMERS MFG. CO.
Milwaukee, Wisconsin

Gentlemen:

Yes, I would like to receive free of charge a copy of your "Plain Facts on Wartime Care of V-Belts".

(Name)

(Title)

(Company)

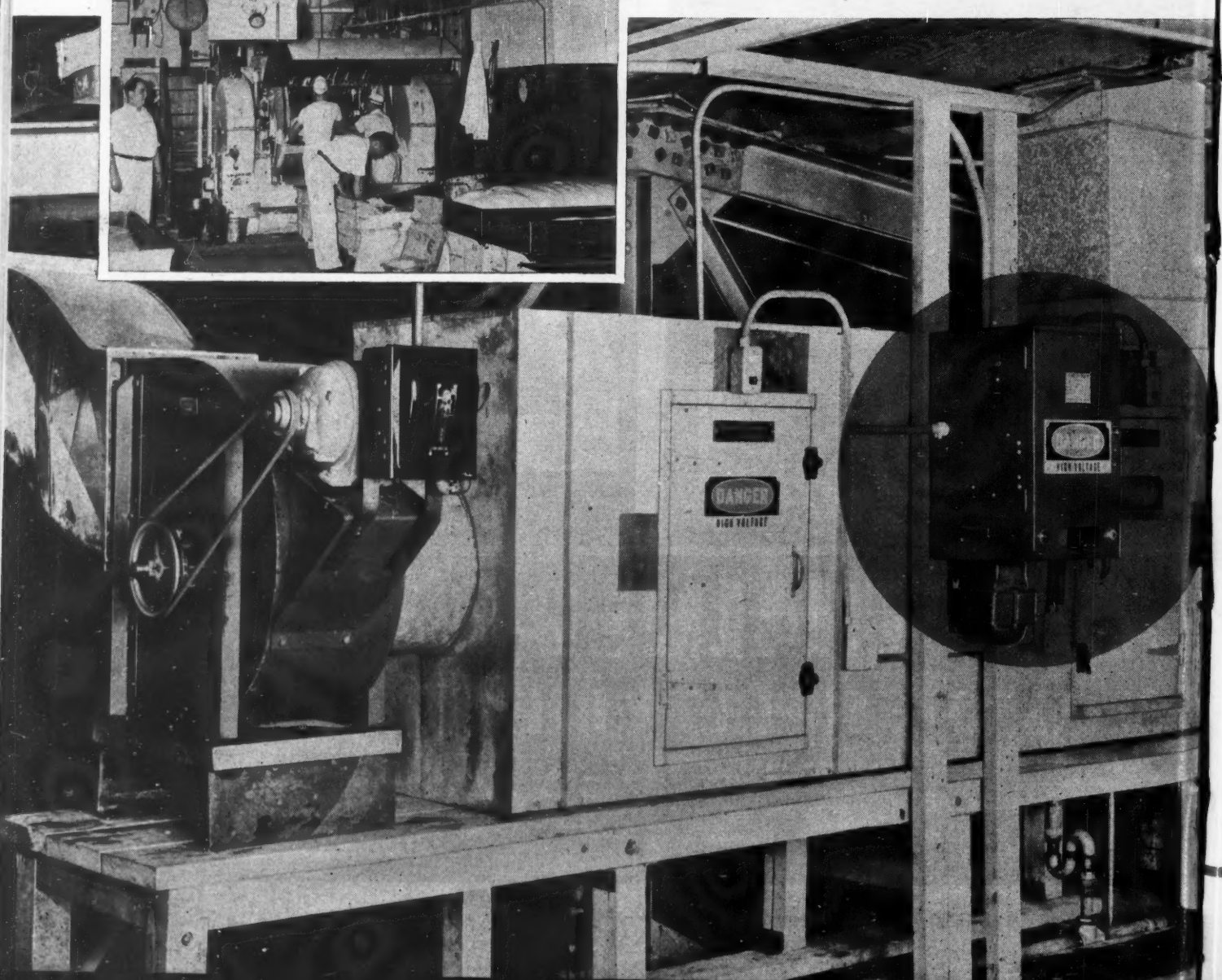
(Street Address)

(City and State) A 1643-5

Electronics...

THE STERILAMP . . . an exclusive Westinghouse development, prevents growth or spread of bacteria or mold in plants where food products are processed or packaged.

THE PRECIPITRON electric air-cleaning unit employs an electronic power pack and charged collector plates to trap tiny air-borne dust particles. A typical application is in the fermentation vat room of a brewery—illustrated here.



AT WORK

IN THE FOOD INDUSTRY

Today's Need For Increased Production, Stepped-Up Efficiency, Inspires New Interest in Electronic Devices

Electronic devices have passed the "experimental" stage in the food industry. With thousands of such devices already in use, with costs decreasing and new applications being constantly developed—the science of electronics is helping America's food processors to win their wartime production battle.

Here are some of the ways Westinghouse electronic products can contribute—and are contributing—to this vital job.

CLEANING THE AIR

in processing and packaging rooms. Here the Westinghouse PRECIPITRON*, an electrostatic air cleaner, insures dust-free air for food dehydration rooms, aeration rooms, grinding rooms, wort cooling rooms, etc. By means of collector plates charged to 6,000 volts d-c through an electronic power pack, the PRECIPITRON removes air-borne dust particles as small as 1/250,000 of an inch.

CHECKING BACTERIA AND MOLD GROWTH

Wherever purity of the product is essential —as in bakeries, cheese plants, dairies, meat packaging plants—the Westinghouse Sterilamp is widely used. Through ultraviolet radiation, the Sterilamp checks growth of bacteria and mold, prevents their settling on sterile materials while being cooled, wrapped or packaged.

PRECISE CONTROL OF PACKAGING OPERATIONS

Photoelectric control is fast replacing human control in high-speed packaging operations. A typical application is on the high-speed wrapping machinery used by the bread industry. Here, precise photoelectric control prevents errors in printing, cutting and automatic wrapping. In other operations, photoelectric cells count or classify articles passing on a conveyor faster than the human eye can see.

X-RAY EXAMINATION

Some of the newer applications of electronics promise great things for the future. Mass x-ray examination of foods, analysis of vitamin content are intriguing possibilities for the future.

For full information on Westinghouse electronic devices for the food industry, phone your nearest Westinghouse office. Or write Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. J-94595

*Trade Mark Registered

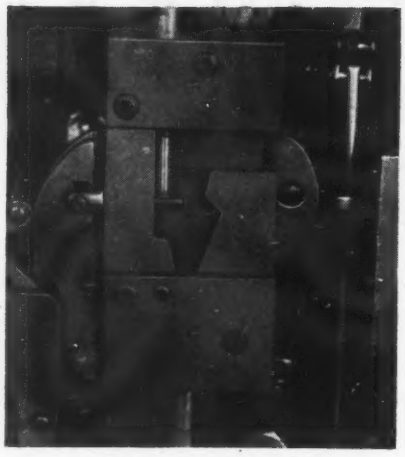
Westinghouse ELECTRONICS

WESTINGHOUSE

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

better Methods with mechanical fingers



A connecting link assembly machine which replaces human fingers and eliminates the possibility of error.

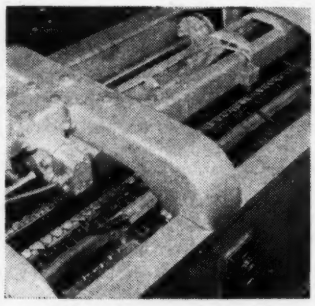
Machine designers have done amazing things in multiplying power and speed. Even more astonishing are their achievements in creating machine assemblies which perform work that previously only human fingers could do. Baldwin-Duckworth engineers, in constantly striving to give these designers and maintenance engineers the finest roller chain belts for power transmission and conveying tasks, have themselves designed outstanding machines to make them. This connecting link assembly machine, for example, completely replaces hand-sorting of non-symmetrical pins having a tenon at one end and a cotter pin hole in the other. Its mechanical "fingers" turn end-for-end, and place the pins correctly as they come from the hopper, eliminate all possibility of error, and assure a uniformly assembled finished product.

better Drives with Baldwin Roller Chain Belts

Roller chain belts provide better solutions for many drive problems. It is equally true that *better* roller chain belts give even better drives. This fact lends meaning to the precision methods of Baldwin manufacture. It accounts for the unfailing dependability, the split-second timing, jerk-free smoothness and virtually 100% efficiency which characterize Baldwin drives. It is worth remembering, too, that *chain belts are the* only *medium of power transmission that can absorb shock loading without loss of speed ratios or efficiency.*

Your Baldwin-Duckworth catalog will give you data on standard applications of chain belts, and for specialized applications a Baldwin man will supply any information you may require. He will be glad to work with you on transmission or conveying operations of any machine which you may be designing, adapting or which needs greater timing or driving efficiency. Baldwin-Duckworth Division of Chain Belt Company, 325 Plainfield St., Springfield, Mass.

EXAMPLE



This paper milk bottle forming and filling machine carries bottles from filling unit to sealing unit. It relies on Baldwin Roller Chain Belts for:

1. Split-second timing.
2. Continuous, jerk-free operation.
3. Virtually 100% efficiency.

IT'S BALDWIN-EQUIPPED

better Drives through better Methods

BALDWIN

ROLLER CHAIN BELTS

Putting a patch in a smoke screen

HIDDEN by a dense smoke screen, American troops creep up on an enemy position.

Suddenly a gust of wind blows a hole in the smoke, exposing the men to the enemy. Instantly one soldier grabs for his belt . . . slips off a little can . . . heaves it at the opening!

As the can hits the ground, it belches smoke—thick enough to patch up the hole. The men move forward, once again concealed.

The Army calls this can a smoke grenade. But it doesn't contain smoke! It's filled with chemicals that make smoke when a mechanism is released. And it has an ingenious device that delays the action so the chemicals won't burn the thrower's hand.

These secret chemicals must be protected against dampness, dirt, mud—the rough-and-tumble handling of war. They've got to get there—*safe*. They do . . . in cans. Cans are rugged!

America's favorite container—the can that's still bringing you many essentials—will finish its war job some day and be back, better than ever. We're learning plenty as "Packaging Headquarters for America" at war.

NOTE TO WAR MANUFACTURERS

Rushed as we are, we can still take on more war work. A part of our vast metal-working facilities for forming, stamping, machining and assembly is still available. Write or phone our War Products Council, 100 E. 42nd St., N. Y. C.

It gets there-safe-in cans

CONTINENTAL CAN COMPANY

HELP CAN THE AXIS
—BUY WAR BONDS

"I was one of the wise guys!"

"Nuts," I used to say to this Mack salesman. "I should pay you more for a truck when I can get another kind cheaper? So what if it ain't as good? I run the hell out of it—then I buy me a new one. That way I'm ahead of the game and I always got a new truck, see?"

I was a smart apple, I was. Yeah.

Now look at me—right behind the eight-ball. Sure I still got a truck and I'm stuck with it for the duration! What that junkheap is doing to me shouldn't happen to Hitler.

And that ain't all. That brother-in-law of mine, Benny, he bought a Mack 'way back, and he ain't letting me forget it for a minute.

You shoulda heard him last night. "Just like I always say," he crows. "You pays your money and you takes your choice. Now you take that Mack of mine. That baby's been over a hundred thousand miles and I ain't had the case down yet. Never missed a trip, and what's more, the way she's running, I know I ain't going to!"

Personally, I still think somebody dropped Benny on his head when he was a baby. But here lately, I'm beginning to think it didn't do him no harm.

Mack Trucks, Inc., Empire State Building, New York, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J. Factory branches and dealers in all principal cities for service and parts.

Mack

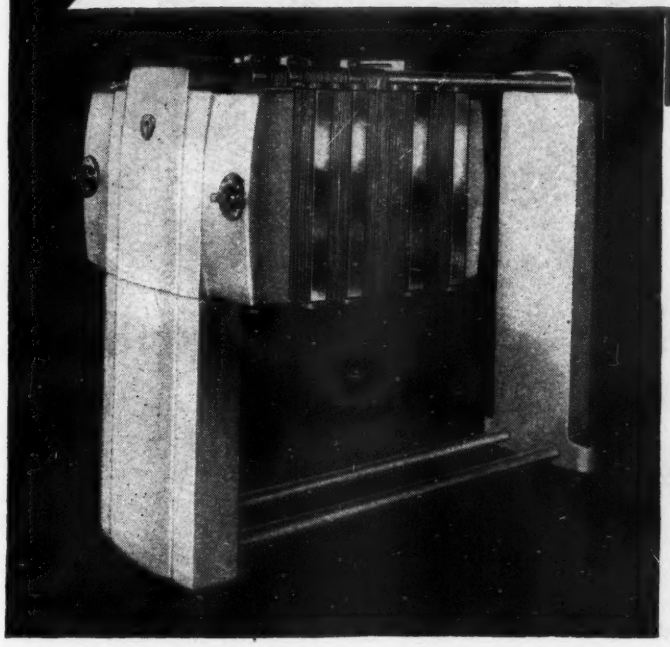
TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

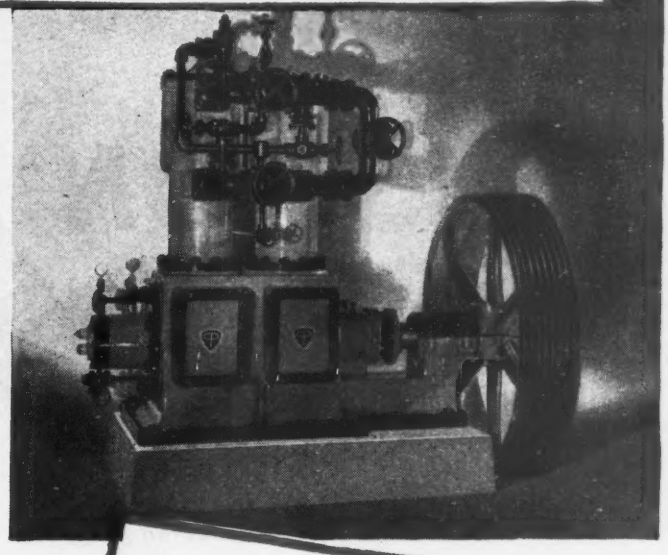
IF YOU'VE GOT A MACK, YOU'RE LUCKY...IF YOU PLAN TO GET ONE, YOU'RE WISE!

WORTH KNOWING

CP FULL-FLO PLATE HEAT EXCHANGER
For Cooling, Heating or Regeneration



CP REFRIGERATING MACHINERY



● In the challenging days ahead the importance of new and improved equipment will loom large. The demand will be for production, economy and efficiency far ahead of today's standards.

Now is the time to get the facts on the versatility and economy of the CP Plate Heat Exchanger and the dependable performance of the CP Ammonia Compressor. It will also pay you to investigate CP accessory equipment and supplies, a few of which are listed here.

PUMPS
SANITARY PIPE and FITTINGS
AMMONIA VALVES and FITTINGS
INDICATING and RECORDING THERMOMETERS
EMERY AGGREGATE FLOORS
CLEANING COMPOUNDS
BRUSHES
LABORATORY GLASSWARE
Write for CP Supply Catalog

Creamery Package

THE CREAMERY PACKAGE MFG. COMPANY, 1243 W. Washington Blvd., Chicago 7, Ill.

Branches: Atlanta — Boston — Buffalo — Chicago — Dallas — Denver — Kansas City
Los Angeles — Minneapolis — New York — Omaha — Philadelphia — Portland, Oregon
Salt Lake City — San Francisco — Seattle — Toledo — Waterloo, Iowa

CREAMERY PACKAGE MFG. CO. OF CANADA, LTD., 267 King St., West, Toronto 2, Ont., Canada

ON GUARD against FRICTION

Today's stepped-up production schedules calling for ever-increasing loads and speeds of machinery in all lines of industry have definitely established the fact that PROPER LUBRICATION IS THE NO. 1 ESSENTIAL. There is NO industrial item of greater importance.

LUBRIPLATE, "The Modern Lubricant," will help you keep FRICTION out of your plant. This is no time to be losing the precious production time of your machines, by fooling around with hot or scored bearings, worn gears, chains and other machine parts, also remember this . . . replacements are most difficult to obtain these days.

LUBRIPLATE is truly the lubricant to cope with today's requirements . . . it possesses characteristics not to be found in other lubricants. LUBRIPLATE maintains a wear-resisting, load-bearing film on contacting moving machine parts. LUBRIPLATE definitely *arrests progressive wear.* It protects machine parts against rust and corrosion. It saves power.

LUBRIPLATE is extremely economical because a little goes a long way . . . it stays put and lasts and lasts.

Regardless of the nature of your business, if you use machinery you need LUBRIPLATE. Let us know your industry so that we can mail you "THE LUBRIPLATE FILM" and other valuable data . . . no obligation.

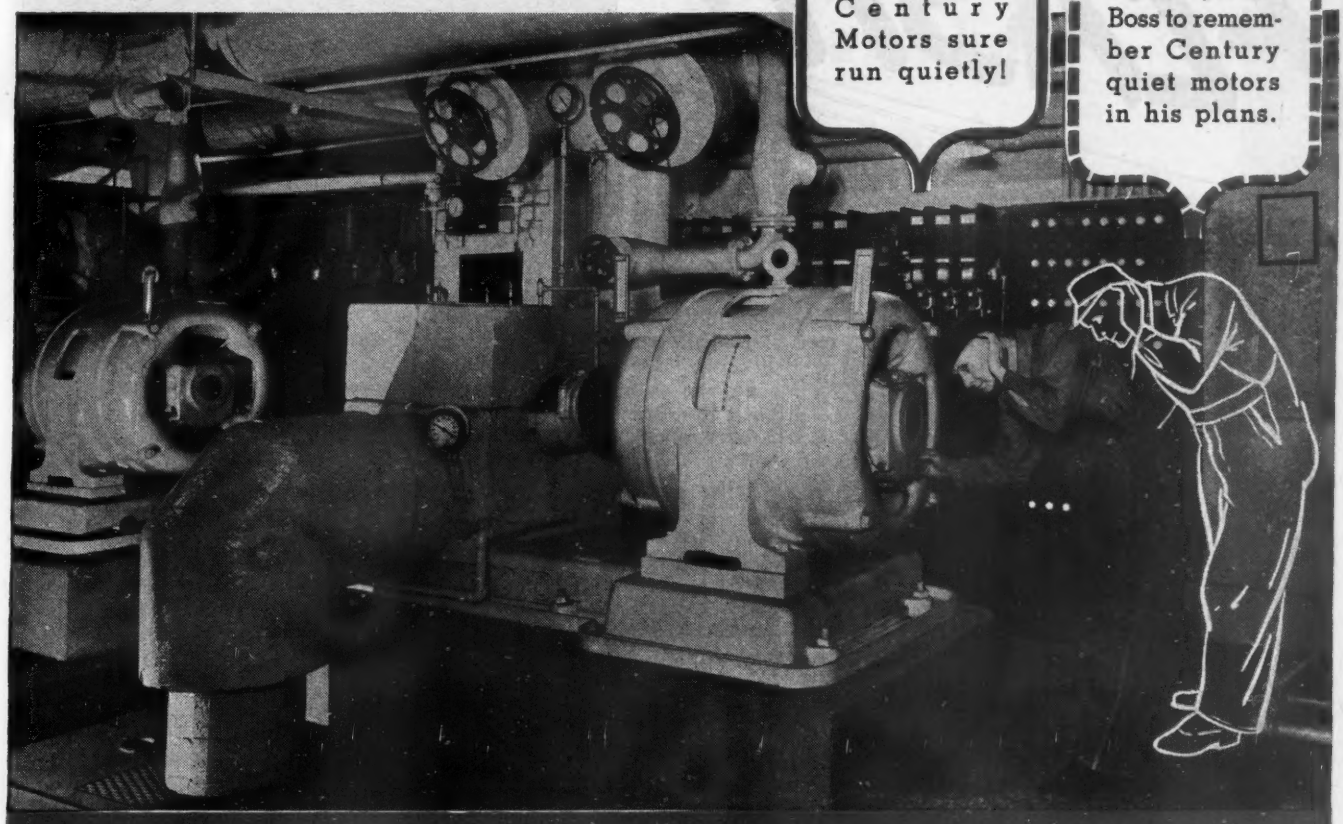
LUBRIPLATE DIVISION
FISKE BROTHERS REFINING COMPANY
SINCE 1870
Newark, N. J. Toledo, Ohio
DEALERS FROM COAST TO COAST

LUBRIPLATE

THE MODERN LUBRICANT *that Arrests Progressive wear*

"Its the Film"

Take a Look at TOMORROW—*Today!*


Mr. Now:
You can say that again! Century Motors sure run quietly!
Mr. Postwar:
I gotta get the Boss to remember Century quiet motors in his plans.

CENTURY MOTORS Start *QUIETLY* and Run *QUIETLY*

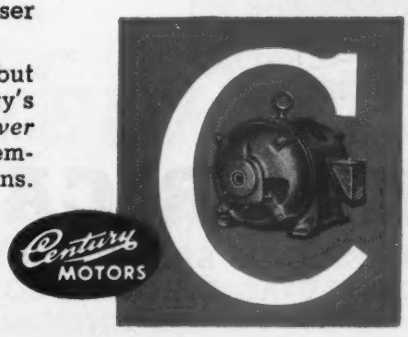
There are many reasons for the exceptionally quiet performance of *all* Century Motors, no matter what the size. One is the close tolerances permitted in their construction — another is the unusual freedom from electrical and mechanical vibration — another is the engineering of Century's unique bearing bumpers which reduces chatter from any V-belt irregularities.

When driving pumps, compressors, and blowers, quietness is important to the mental comfort of workers — or customers. In machine tool applications, this freedom from vibration makes possible closer tolerances, faster production, and fewer rejects.

Quietness and freedom from vibration are but two of the many advantages resulting from Century's careful, experienced motor engineering. *Whatever* your motor requirements, it will pay you to remember Century Motors today and in your postwar plans.

CENTURY ELECTRIC COMPANY
1806 Pine Street St. Louis 3, Missouri

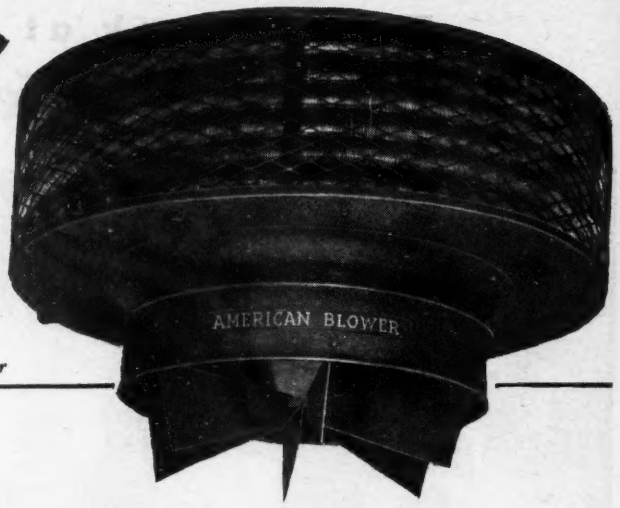
Offices and Stock Points in Principal Cities



337

One of the Largest EXCLUSIVE Motor and Generator Manufacturers in the World.

FLASH!



American Blower
Vertical Unit Heater

WPB SIMPLIFIES THE METHOD OF BUYING UNIT HEATERS

★ Question:

Are any special forms required to obtain unit heaters?

★ Answer:

No! Under the streamlined set-up just announced by WPB, it is no longer necessary to fill out PD 412-A Forms.

★ Question:

Who is eligible to buy heaters?

★ Answer:

Any person is eligible to buy unit heaters now, who has an order for unit heaters carrying a priority rating of AA-5 or better, with a specified delivery date.

★ Question:

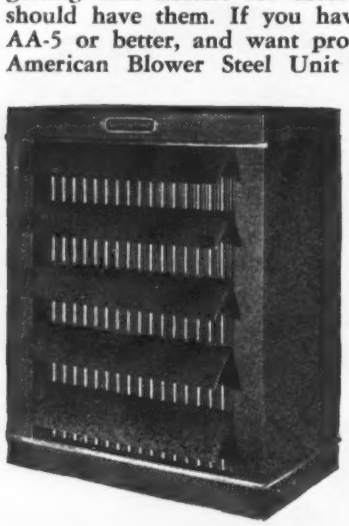
Are unit heaters still available? What types?

★ Answer:

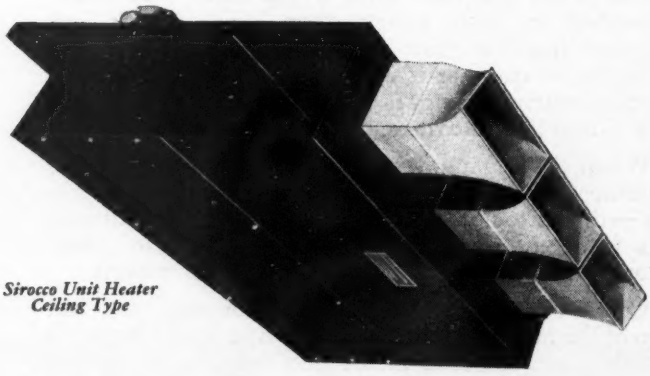
Yes. Horizontal Unit Heaters, 24,000 B.T.U. and larger — Vertical Units, 144,000 B.T.U. and larger — Blower Type Units, 216,000 B.T.U. or larger — all with constant speed motors — are available.

The WPB has greatly simplified the process of getting unit heaters for those who need and should have them. If you have a Priority of AA-5 or better, and want prompt delivery of American Blower Steel Unit Heaters of the Vertical Type for ceiling suspension or of the Horizontal or Blower Type for wall or ceiling installation in your factory, warehouse, shop, garage or assembly plant, get in touch with an American Blower Distributor or the nearest American Blower branch office.

Unit Heaters save vital fuel, save critical materials and save production space.



Venturafin
Unit Heater



Sirocco Unit Heater
Ceiling Type

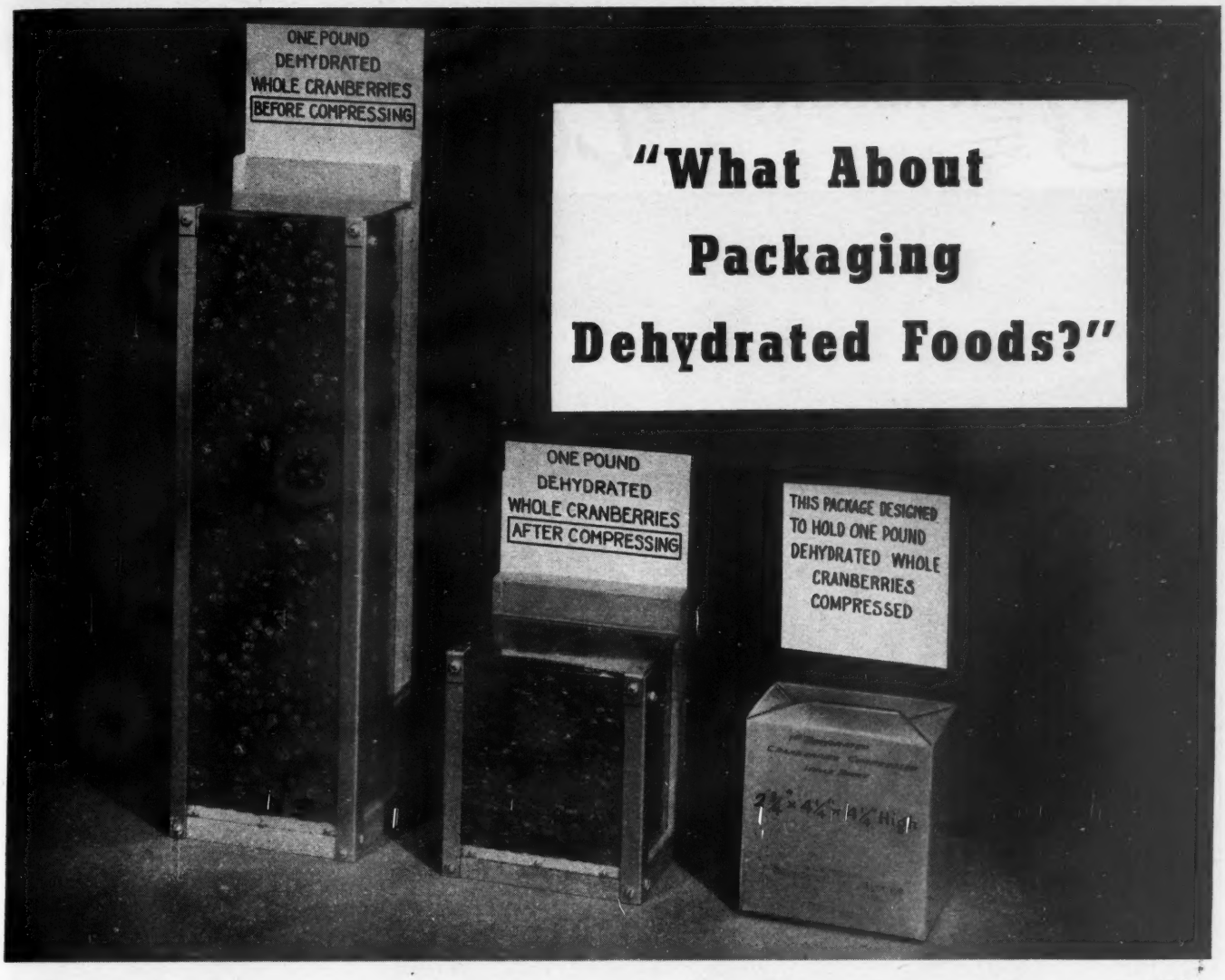
ARMY E NAVY
For production "Well Done"

AMERICAN BLOWER

AMERICAN BLOWER CORPORATION, DETROIT, MICH.
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONT.

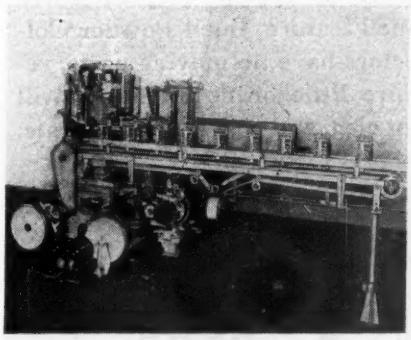
Division of AMERICAN Radiator and "Standard" Sanitary Corporation

AMERICAN BLOWER — MECH. DRAFT · AIR-CONDITIONING · FLUID DRIVES · DUST COLLECTORS



IT DOESN'T take any gazing into a crystal ball to see that many signs point to the increasing importance of dehydrated foods. Our research staff has already made significant strides in mastering the problems of packaging *and compressing* these products. The same vision and canny patience that have produced over 80 major machines for packaging and bottling have arrived at sound principles for packaging dehydrated foods. For this tremendous job, Pneumatic Machines have been designed to give, as always, "lower cost per container".

We are busy at Pneumatic today turning out ordnance equipment. But we have made provision in our present production schedule to continue to give your orders for essential new equipment and necessary replacement parts prompt and careful attention. Pneumatic Scale Corporation, Ltd., 91 Newport Avenue, North Quincy, Massachusetts. Branch Offices: New York, Chicago, San Francisco, Los Angeles.



Here's Pneumatic's automatic Standard Carton Feeder and Bottom Sealer. It's but one of more than 80 machines that prove Pneumatic's slogan —"Lower Cost per Container".

PNEUMATIC

PACKAGING & BOTTLING MACHINERY

IN MAKING THE *Coffee* YOU MAKE IN YOUR CUP

Buell Powder Collectors Play an Important Part

Add instant coffee to the growing list of dehydrated products to whose processing Buell Powder Collectors are bringing new efficiencies and economies.

Here, as in the dehydration of eggs, milk, soups, citrus juices, and other products, Buell Powder Collectors are an essential part of a proper spray drying system—assuring virtually 100% recovery of powder that would otherwise be lost in the exhaust. In many instances, savings effected through recovery of material quickly pay for the cost of installation.

Buell Powder Collectors specially designed for food processing are made of special metals to meet all Pure Food requirements. Corners are rounded to prevent lodgement of material, and an ingenious hinged construction facilitates take-down for easy cleaning.

The high efficiency of Buell collectors is due to the patented van Tongeren cyclone—an exclusive Buell feature. Buell Powder Collectors have no moving parts, require little or no attention, will not clog, and cost little to operate.

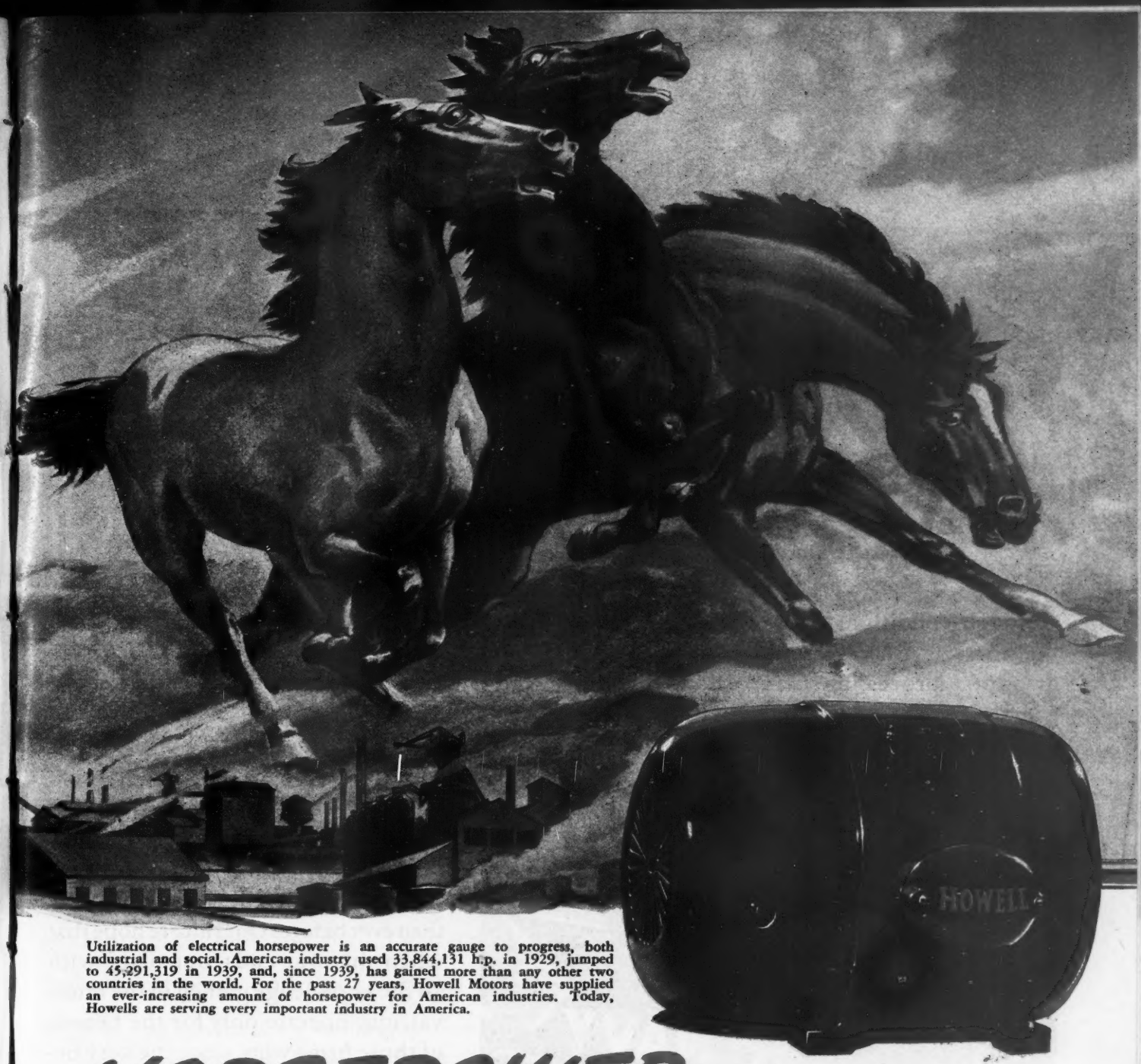
Write for factual 28-page book "Bulletin G-842"

BUELL ENGINEERING COMPANY, INC.
Suite 5000, 8 Cedar Street, New York
Sales Representatives in Principal Cities

BUY WAR BONDS AND MAKE THE AXIS BITE THE DUST

buell
POWDER RECOVERY SYSTEMS

CONSULT BUELL *First* IN DUST RECOVERY
for Chemical • Rock Product • Metallic • Food • Flue or any other dusts



Utilization of electrical horsepower is an accurate gauge to progress, both industrial and social. American industry used 33,844,131 h.p. in 1929, jumped to 45,291,319 in 1939, and, since 1939, has gained more than any other two countries in the world. For the past 27 years, Howell Motors have supplied an ever-increasing amount of horsepower for American industries. Today, Howells are serving every important industry in America.

HORSEPOWER

BY HOWELL-FOR YOUR INDUSTRY

You're looking at the electric motor that has won a high place in American industry for dependability, quiet operation and honest value.

It is a precision-built motor throughout.

In wartime production, where time is precious and delays are disastrous, here is another feature of Howell Motors you cannot afford to overlook:

You can load them with full confidence in their ability to stand up under the toughest jobs you can assign within the limits of safety.

Now that the War Production Board requires you to use electric motors of the lowest possible horsepower you are safe in specifying horsepower by Howell.

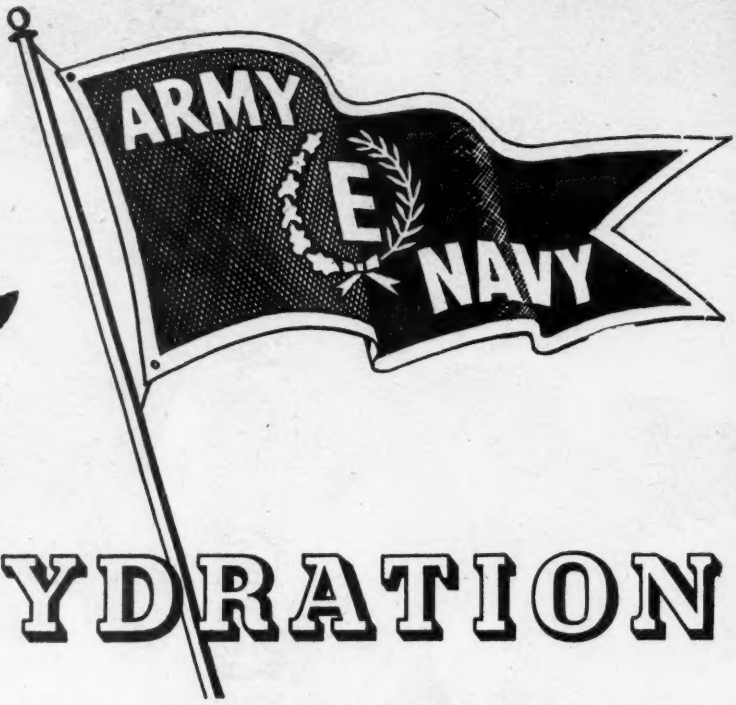
Let Howell engineers aid you in selecting the proper rated motors for your requirements and obtain this safety factor which is so vital in these times.

HOWELL ELECTRIC MOTORS COMPANY

HOWELL, MICHIGAN

Manufacturers of Quality Motors Since 1915

The **HOWELL IDEA** in Electric Motors *precision-built*



First in DEHYDRATION

Though conditions may no longer permit "business as usual," the fact that we are the first food processing plant exclusively engaged in dehydration to win the coveted Army-Navy "E" award, attests to the fact that we are still doing a job. Today, we have only one thought in mind—on to Victory—and if we can help hasten this end by making our entire production available to the Armed Forces, we consider it both a privilege and a duty to do so.

For outstanding excellence in the production of dehydrated onion flakes used by the Armed Forces, the "E" pennant awarded The C. B. Gentry Company is shown here. Reading left to right is Colonel Arthur W. Stanley, Director of Procurement of the California Quartermaster Depot, who made the award, George E. Clausen, President of C. B. Gentry Company, Lloyd C. Bellisime, also of the Company, and Lt. Commander Allen R. Bosworth, presenting officer of the United States Navy.

During these days of business dislocation, we have learned many things—chiefly how to produce far superior quality in greater volume than ever before. Our sincere hope that when this war ends, our plant with all the knowledge gained in the interval, may operate only for the benefit of those firms who, since the very beginning, make this company possible.

This award then, is not only to the credit of the C. B. Gentry Company and its co-workers but to the credit of all firms who willingly understood and permitted the War Department to take preference over our entire production. As we are saluted, so do we in turn salute you!

Dehydration Division
GILROY, CALIFORNIA

C. B. GENTRY CO.

GENERAL OFFICES
LOS ANGELES, CALIF.

TOP SPECIALISTS IN ONION & GARLIC DEHYDRATION

Have You a Traffic Jam

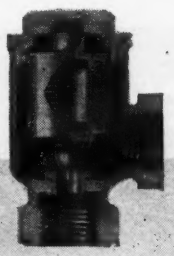
IN YOUR STEAM LINES?

Now, when the call is for more and more production, faster and faster, you cannot afford to have steam heated process equipment slowed up by sluggish steam coils or water-logged supply lines.

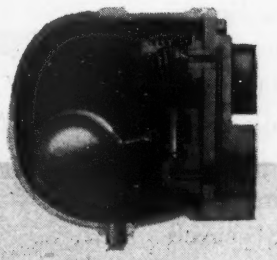
In other words, good steam traps now are more important than ever. Sarco makes four distinct types and can select the type to give you quickest air venting and maximum heating efficiency without lag or waste.

We can also suggest simple temperature controls which will prevent spoilage and stop wasteful overheating.

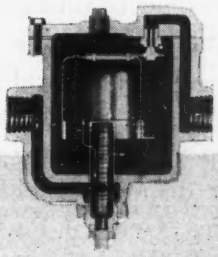
The Sarco Hook-Up Book contains helpful suggestions on proper selection of steam saving equipment and many tested hook-ups not published elsewhere. A copy is yours for the asking.



Sarco No. 9 thermostatic steam trap for individual trapping of steam coils.



Sarco float-thermostatic steam trap for tanks, lines, and temperature controlled hook-ups.



Sarco bucket trap for heavy duty and intermittent service.

Sarco No. 87 steam trap-control

Sarco temperature controls hold tank and process temperatures within a few degrees.

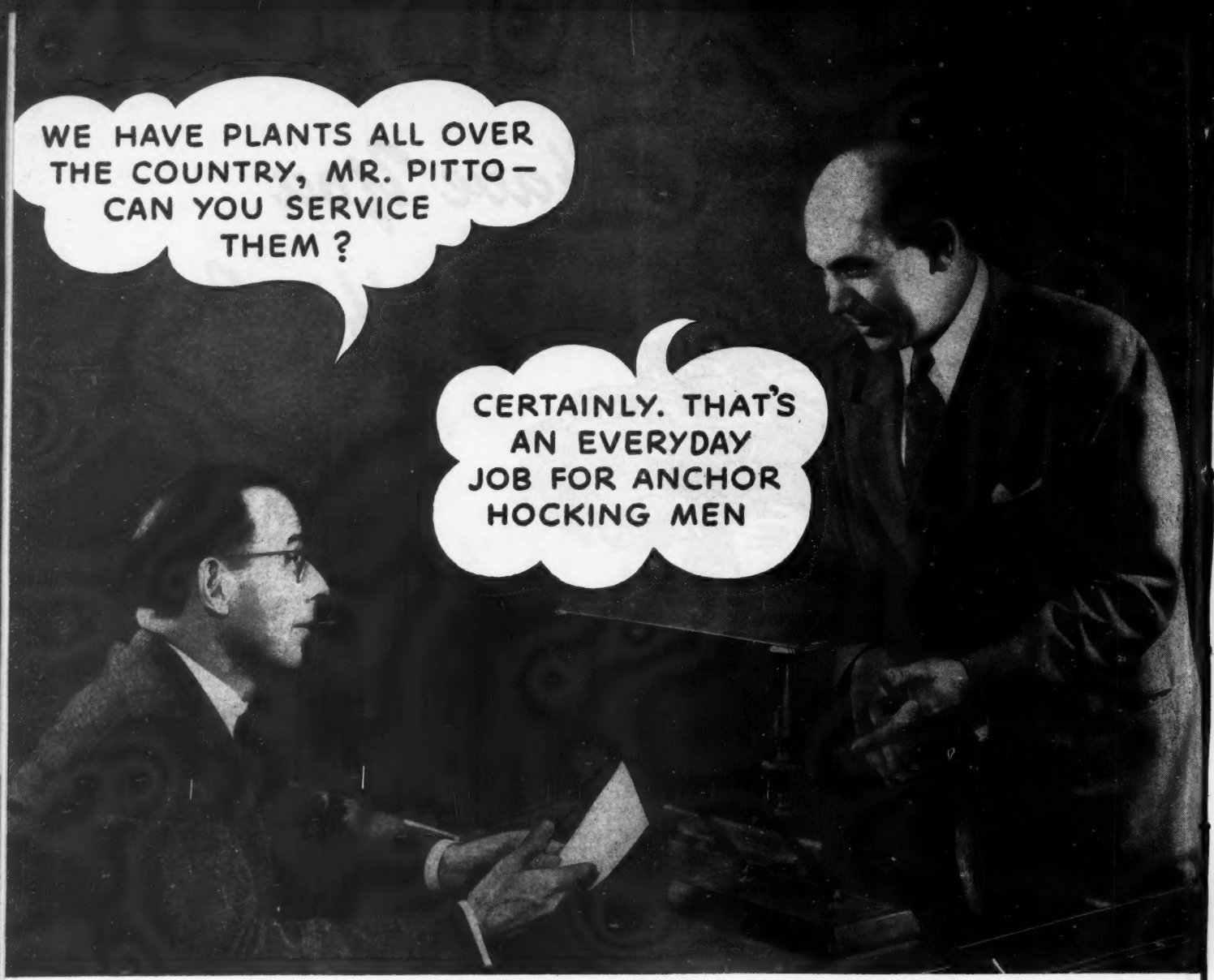
SARCO COMPANY, INC.
475 FIFTH AVENUE
NEW YORK 17, N. Y.

SARCO Saves Steam

Represented in Principal Cities

SARCO CANADA, LTD., 85 Richmond Street, West, TORONTO, ONTARIO

14



Continuously at your service are 23 Anchor Hocking branch offices, located in principal U. S. and Canadian cities. In each of them you'll find a friendly group of widely experienced sales and service engineers, with the latest facts on today's packaging conditions. Does your problem concern containers? Closures, liners, gaskets? Sealing machines, cartons, packaging line difficulties? Plant conversion to handle glass—or a practical interpretation of the latest W.P.B. order? Your nearest Anchor Hocking sales engineer is fully qualified to help you. And for special technical assistance, he will place at your disposal Anchor Hocking's extensive Experimental Laboratories, General Packaging Research Division and Engineering and Package Design Departments.

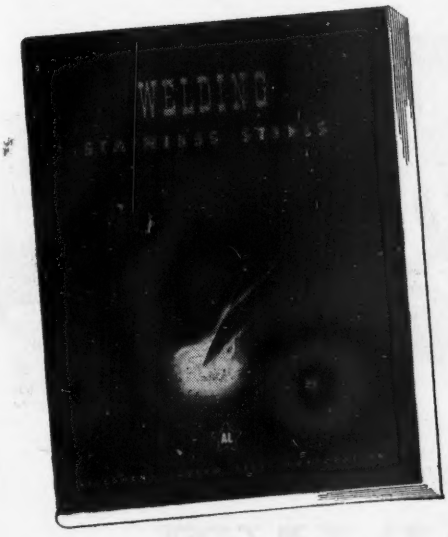
L. R. (JOE) PITTO, one of Anchor Hocking's ablest and most popular men, has been a member of the Anchor Hocking family for 14 years.

ANCHOR HOCKING

GLASS & CAPS

ANCHOR HOCKING GLASS CORPORATION LANCASTER, OHIO

ARE YOU WELDING STAINLESS STEEL? HERE'S *New Light* ON THE SUBJECT



This book can save you time and avoid spoilage of vital alloys, both more than ever essential to the war program today. Describes and illustrates equipment, procedures, precautions. Request copies on your company letterhead, please.

ADDRESS DEPT. FI-5

SUCCESSFUL stainless steel welding, as many a shop has found out the hard way, puts a premium not only on knowing what to do, but also what to avoid doing—and why.

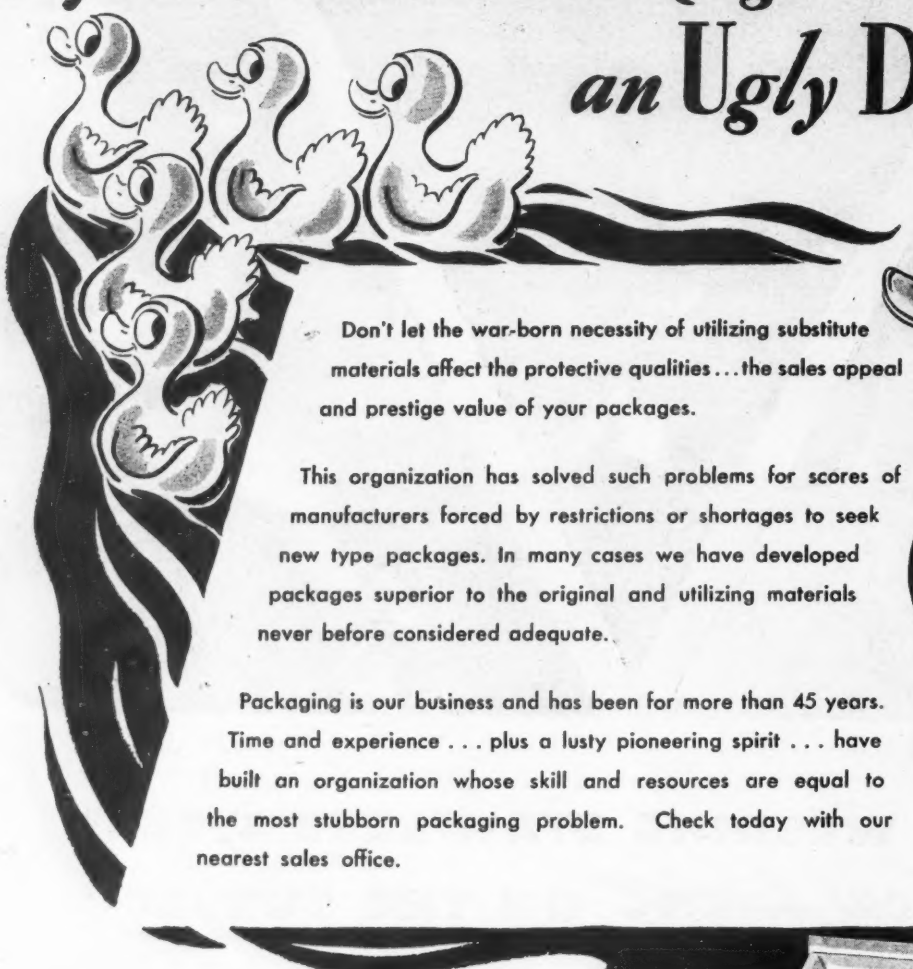
That is because the problem, first of all, is a double one as compared to ordinary carbon steel welding, since it calls for maintaining the corrosion resistance of the parent metal across the weld area, as well as its strength. Furthermore, although stainless steel welds easily, the various members of the stainless family differ considerably from carbon steel—and even from each other—in the physical and chemical phenomena they exhibit during the welding process.

Information, clear and complete, is the basic answer. We've supplied it in a new 64-page, full-color booklet, *"Welding Stainless Steels,"* covering all the commonly-used hand or machine methods of welding Allegheny Metal. Employing a new idea in graphic illustration, this book is, we believe, the most complete and understandable coverage of the subject yet published—a welding shop "bible" purposely made so clear and simple that it is also ideal for student training. ● *Write for your copy (see at left).*

Allegheny Ludlum
STEEL CORPORATION
BRACKENRIDGE, PENNSYLVANIA

A-9078 . . . W&D

Is your wartime *Package* *an Ugly Duckling?*



Don't let the war-born necessity of utilizing substitute materials affect the protective qualities . . . the sales appeal and prestige value of your packages.

This organization has solved such problems for scores of manufacturers forced by restrictions or shortages to seek new type packages. In many cases we have developed packages superior to the original and utilizing materials never before considered adequate.

Packaging is our business and has been for more than 45 years. Time and experience . . . plus a lusty pioneering spirit . . . have built an organization whose skill and resources are equal to the most stubborn packaging problem. Check today with our nearest sales office.

Packaging engineers to a nation at war

MILPRINT Inc.

Plants at MILWAUKEE • PHILADELPHIA • LOS ANGELES

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Sales offices NEW YORK • CHICAGO • BOSTON • SAN FRANCISCO • ATLANTA • MINNEAPOLIS • ST. LOUIS

Pump Quiz:

Q: What is the most commonly made mistake in packing stuffing boxes?

A: Forcing in a ring or two of new packing against the old packing, instead of replacing the old completely. Packing should be replaced periodically, using the type recommended by your pump manufacturer.

Q: What do you do if no water is delivered?

A: First, check these possible causes: 1) Lack of prime. 2) Speed too low. 3) Discharge head too high. 4) Suction lift too high. 5) Impeller completely plugged. 6) Wrong direction of rotation. Then, for list of cures, see page 21 of "Handbook for Wartime Care of Centrifugal Pumps".

Q: How tight should a gland be drawn?

A: To control liquid flow, it should be drawn just tight enough so that a thin stream of liquid flows from the stuffing box during pump operation.

Q: Which goes into position first on installation...the pump or the piping?

A: All piping should be in place and self-supporting *before* connection. Openings should meet with no force. Otherwise casing to apt to crack... or spring enough to allow closely fitted pump parts to rub.

Q: How do you determine whether there are air leaks in the stuffing box?

A: Check to see if thin stream of water flows from stuffing box while pump operates. If not — and adjusting gland to reasonable extent does not produce flow — new packing is probably needed. Or — water seal piping may be plugged... lantern ring may be displaced. Pages 21, 22 and 23 of "Handbook for Wartime Care of Centrifugal Pumps" contain tables showing "causes" and "cures" for most common pump ailments.

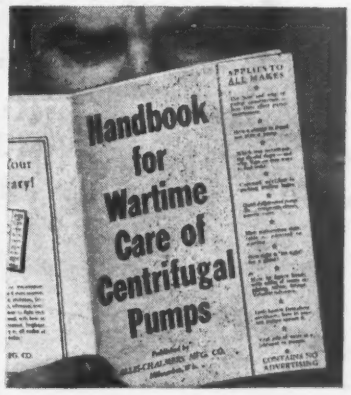
When you do need new pumps — look into the extra efficiency and long life built into Allis-Chalmers centrifugal pumps... all types for every purpose. Meanwhile, every executive, engineer and maintenance man should have a copy of "Handbook for Wartime Care of Centrifugal Pumps" to help make present pumps *last!*

ALLIS-CHALMERS
MILWAUKEE

WE WORK FOR VICTORY — WE PLAN FOR PEACE

DO ALL YOUR MEN KNOW THE ANSWERS TO THESE AND OTHER MAINTENANCE QUESTIONS? IF YOU NOW HAVE A "GREEN HELP" PROBLEM, GET THIS NEW BOOK!

MOST BOOKS on pump care published before the war are *obsolete* today! Why? Pumps that used to work 1800 hours a year now work as many as 8700 hours! For *timely* aid, get your *free* copy of "Handbook for Wartime Care of Centrifugal Pumps"!



Contents include valuable tables of friction losses, a guide to locating trouble, a maintenance timetable geared to wartime! Get *your* copy!

ALLIS-CHALMERS MFG. CO.
Milwaukee 1, Wisconsin

Gentlemen:
Yes, I would like to receive, free of charge, a copy of your "Handbook for Wartime Care of Centrifugal Pumps".

(Name)

(Title)

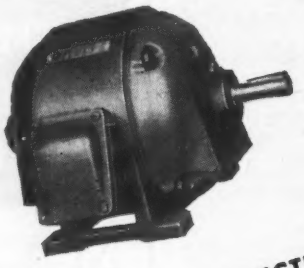
(Company)

(Street Address)

(City and State)

A 1654-2

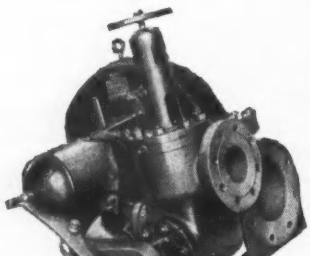
TO KEEP MULTI-STAGE



1 G-E "TRI-CLAD" INDUCTION MOTORS—for machine drives of every kind. Available in open and SPLASH-PROOF (shown) construction. Also totally enclosed. For low-speed drives, G-E gear-motors are available—motor and speed-reducer in a single unit.

2 G-E MOTOR CONTROL—A popular choice in food plants is the CR7008 *combination* starter, containing magnetic switch, circuit switch, and fuses. Standard motor controls can also be obtained in dust-tight (shown) or water-tight enclosures.

WASHING → PEELING CUTTING → INSPECTION → BLANCHING → TRAYING



3 G-E MECHANICAL-DRIVE TURBINES—supply low-cost drive for blowers, etc., while acting as a reducing valve to furnish low-pressure steam for dryer coils. Built in ratings from 5 hp up.

4 G-E TIME SWITCHES—to keep tabs on operating cycles, opening and closing circuits at predetermined intervals. A handy G-E chart (GES-2608) shows type best fitted for your time-control problem.

DEHYDRATION CONTINUOUS

PLAN AN ELECTRICAL SYSTEM THAT WON'T LET YOU DOWN!

IN modern two-stage or three-stage dehydration, continuous product-flow is more essential than ever. And it's not just a drying problem—but one of steady, uninterrupted materials handling, with the *drive* and the *control* for each operation closely "tied-in" together.

That's why new plants are now following the practice of other continuous-process industries in making sure of a *unified electrical system,* worked out from start to finish with the help of G-E application engineers.

With such a system, completely G-E equipped, there are no electrical misfits that may shut down the entire line. Operating controls are uniform; maintenance is easier. Responsibility for electric equipment is centralized, and G.E.'s strong local-office setup is quickly available for service.

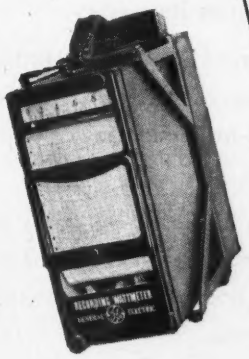
On any food-plant job essential to the war, a call to your G-E office will get prompt action!

General Electric Company, Schenectady, N. Y.

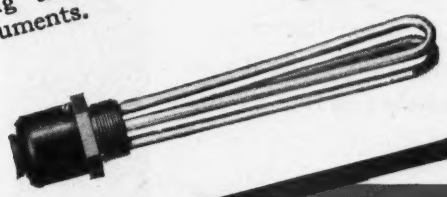
GENERAL ELECTRIC

663-4-110

BUY WAR BONDS



5 G-E AIDS FOR LABORATORIES AND PILOT PLANTS—Calrod heating units for ovens, hot plates, heaters, wherever flexible closely controlled heat is essential: Also electric indicating and recording instruments.

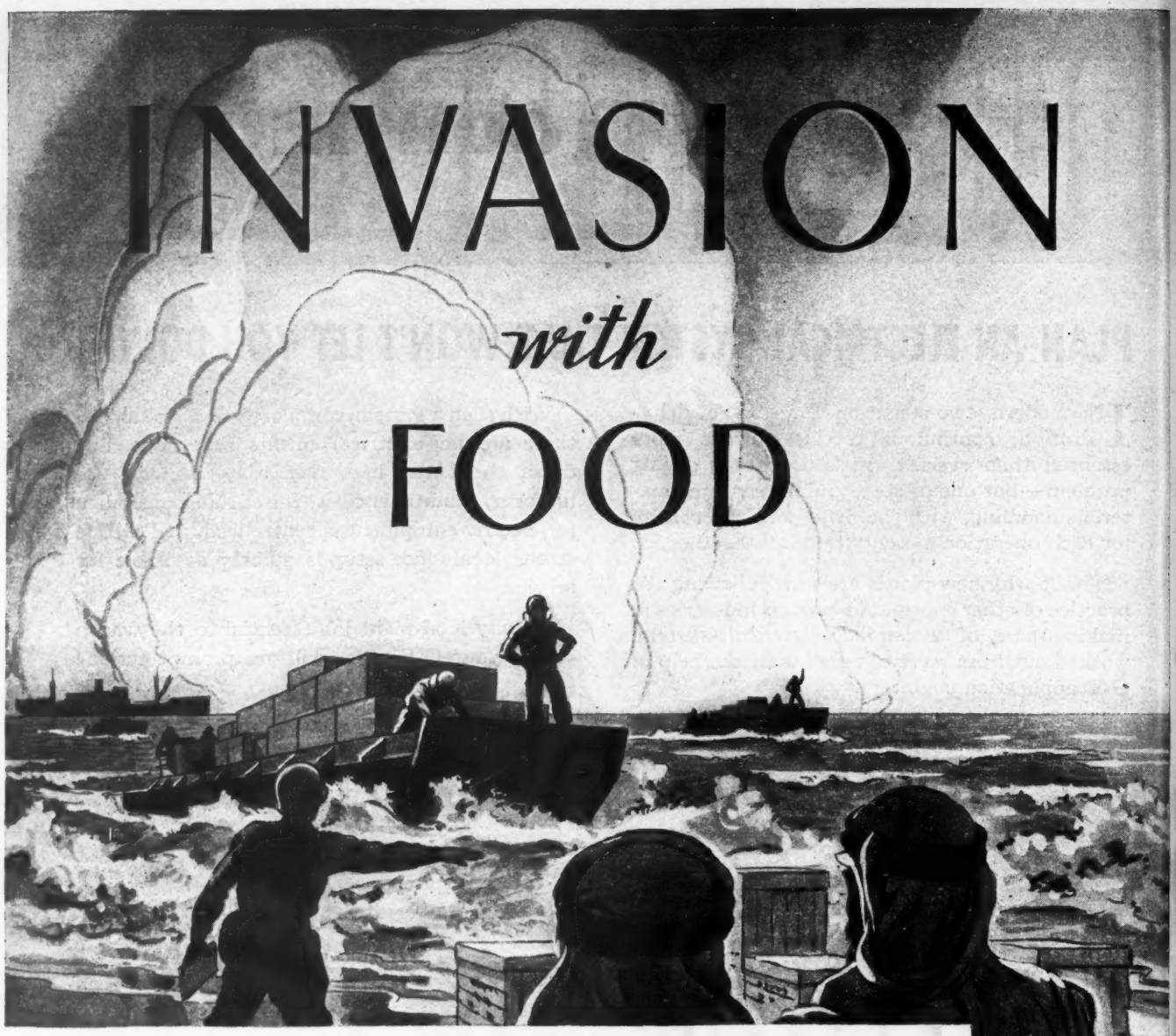


6 AIR-CONDITIONING SYSTEMS—including air washing, cooling, heating, humidification, etc. to produce a "quality-controlled" atmosphere in production areas.

7 LIGHTING FOR INSPECTION—using G-E MAZDA incandescent or fluorescent lamps, "tailored" to the needs of the job.

8 ELECTRONICS—Photoelectric relays and related devices for weighing, packaging, counting, or control.

9 POWER DISTRIBUTION—from substation to the point of use, including cable, unit substation, switchgear, circuit breakers, meters, instruments.



RIGHT behind our soldiers with field rations in their duffle, come the landing barges with food and more food. And after them, a steady stream of food for both conquerors and the conquered, thousands of miles away from its source.

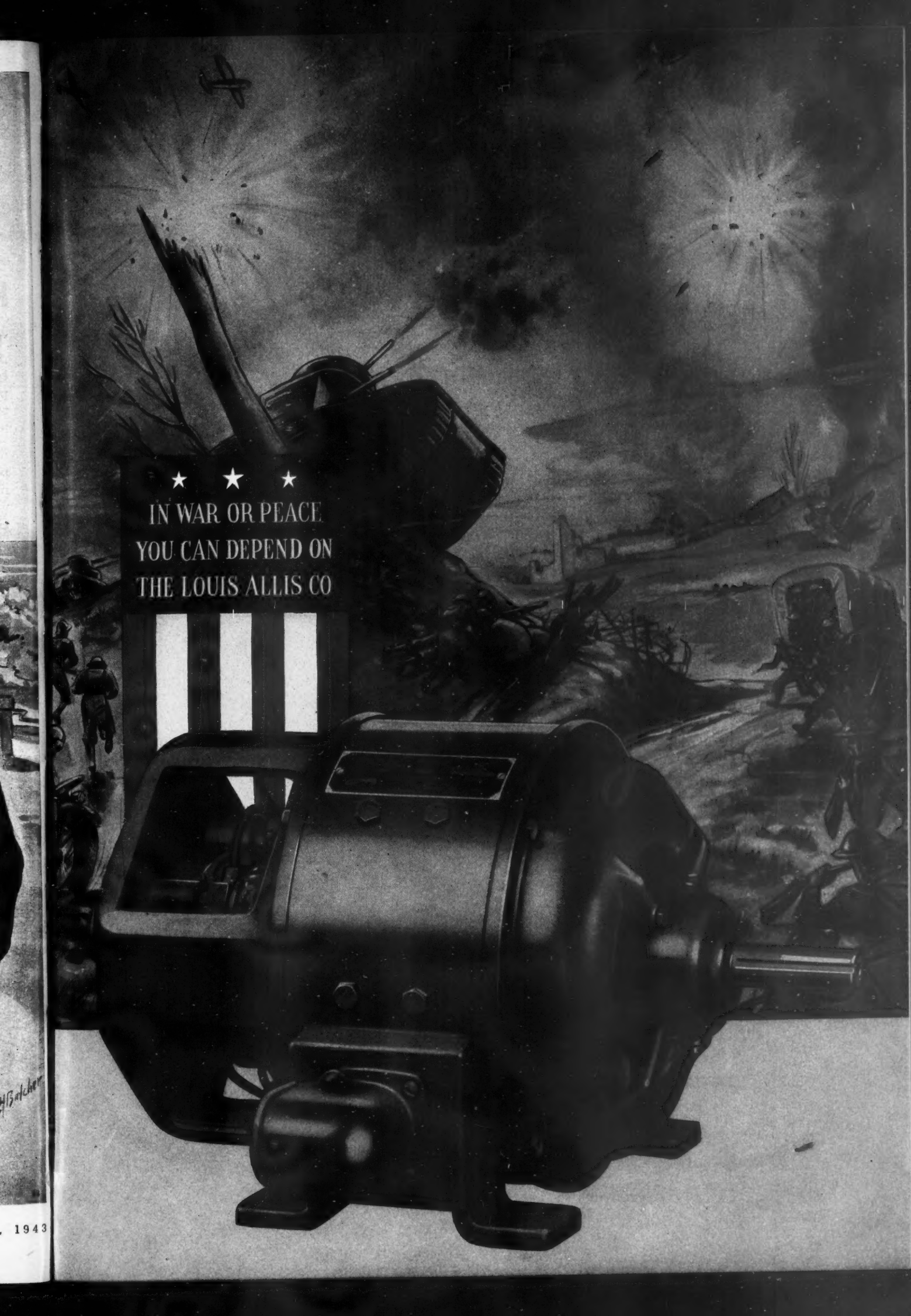
It has required the biggest production and development job the packaging industry ever tackled. Manufacturers of paper, folding boxes, cellophane, foil, glass, bags, barrels and every other possible product and material have cooperated fully and worked hard.

Riegel's protective packaging papers have contributed their full share in this effort. In the meantime it has become even more important to preserve and protect the foods used at home. For this purpose, many remarkable food packages have been developed with materials that are still unrestricted.

Although our papers are no longer generally obtainable, we hope that we may soon have the opportunity of serving in your peace-time efforts. Meanwhile, if you have a protective packaging problem, we will always be glad to help you find a satisfactory substitute elsewhere in the industry.

RIEGEL PAPER CORPORATION

342 MADISON AVENUE • NEW YORK 17, NEW YORK


★ ★ ★
IN WAR OR PEACE
YOU CAN DEPEND ON
THE LOUIS ALLIS CO

Smooth, Trouble-free COMMUTATION

One of the outstanding features of Louis Allis Direct Current motors is their smooth, dependable, trouble-free commutation.

Larger commutator with a greater number of better insulated commutator bars—precision built and machined — reduces to minimum voltage increments between bars.

Over size rigid brush holders flour-grained carbon brushes —double insulated holder studs — assure smooth sliding non-sparking commutation.

These rugged heavily reinforced cast-iron and steel constructed motors are built to cooly deliver a constant flow of dependable power on the toughest jobs.

Available in a wide range of both electrical and mechanical modifications — a size and type for every industrial requirement.

On your very next D.C. motor requirement specify by name — LOUIS ALLIS D.C. MOTOR — it's the motor to depend upon!

A copy of descriptive bulletin No. 507-C will be sent upon request.

THE LOUIS ALLIS CO., MILWAUKEE 7, WIS.

ONE HAS WHAT IT TAKES

...TO LICK YOUR PACKAGING PROBLEMS

To meet the stepped-up demands of victory production, packaging equipment must show plenty of fight. But it's certainly poor economy — and unpatriotic — to draft bantam weight or even welter weight equipment for a heavy weight packaging bout. Now more than ever expert and unbiased advice is required on every packaging problem.

St. Regis promotes no particular one of their three championship packaging systems. All are decisive "winnahs" in their separate fields. Each has demonstrated its ability to deliver the final knockout to the specific packaging problems it was designed to solve. If you pack in 25 to 100 lb. units, baggable in custom-built Multiwall Paper Bags, one of the following packaging systems can save you time, money and manpower.

VALVE PACK—*Maximum Production With Minimum Labor* is assured with the St. Regis Valve Pack System. Automatic Packing Machines (Belt, Screw or Impeller type) preweigh your product and propel it into self-closing, valve type Multiwall Paper Bags. For free-flowing products Gravity Type Packers are used.

SEWN PACK — *Economy, Efficiency and Speed* are the principal features of the St. Regis Sewn Pack System. Automatic sewing machines, applying a bound-over tape and filter cord, sew through all plies of the bag. Uniformly excellent, sift proof closures recommend this system.

TIED PACK — *Economy Closure for Moderate Production* best describes the St. Regis Wire Tied Pack System. No automatic machinery is required with this system, enabling open mouth bags to be closed efficiently and quickly. A hand twisting tool constitutes the entire equipment for effecting the securely tied closure around the neck of the bag.

For the correct answer to any paper bag packaging problem *consult* a St. Regis Packaging Engineer. His technical background and familiarity with the packaging requirements of your industry equip him to give expert assistance in the selection and installation of the packaging system best suited to your needs. Such a consultation can be easily arranged today by phone, wire — or letter.

St. Regis Bags have 3 to 6 independent walls of tough kraft paper fabricated in tube form, one within the other, so each bears its share of the load. Chemical and physical properties of product determine number and weight of kraft and special sheets.

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS PAPER COMPANY

TAGGART CORPORATION • THE VALVE BAG COMPANY

NEW YORK: 230 Park Avenue

CHICAGO: 230 No. Michigan Avenue

BATES VALVE BAG CO., LTD. Montreal, Quebec Vancouver, B. C.

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Los Angeles, Calif. New Orleans, La. Seattle, Wash.
Franklin, Va. Nazareth, Pa. San Francisco, Calif. Toledo, Ohio

Each Demands Competent, Experienced Engineering

● Every plant man knows that the efficiency of an industrial operation depends greatly on getting the right material at the right place at the right time.

But extreme variations occur in these three conditions—materials, place and time—not only from industry to industry but even within a single plant. Consequently, the engineering of successful material handling systems becomes a complex matter of matching the right type of conveying equipment and accessories to each specific job.

This is a highly specialized service, but one for which Stephens-Adamson engineers are fully qualified. For S-A designs and makes ALL kinds of conveying equipment. Whether a job calls for a belt, bucket or screw conveyor—or for a combination of these types—plus whatever accessories may be required—trust the S-A representative for an unbiased recommendation as to the exact system needed to move materials faster, safer and at lower cost.

If you face the problem of modernizing or expanding existing handling equipment to meet present production demands . . . or if you are concerned over new material handling problems that will come with post-war operations . . . have a talk with an S-A engineer now. Write us today.

STEPHENS-ADAMSON MFG. CO.
6 Ridgeway Avenue - Aurora, Illinois

STEPHEN S-A DAMSON
MFG. CO.

Designers and Manufacturers of All Types of
BULK MATERIAL HANDLING EQUIPMENT

Three-act play enjoys record run

. . . packagers invited to meet the Star

THE CAST. Three members of our good-sized troupe. The orange we picked and stored away four months ago. The grapefruit we did the same with five months ago. The carrots got the same treatment *eighteen* months ago. Of course, *all* were stored in sealed-tight wrappers of Goodyear's amazing air-moisture-proof **Pliofilm.**

THE PLOT. While other fruits and vegetables their own age were quietly wasting away, these **Pliofilm**-wrapped beauties stayed placidly perfect. Just look, above! Or just listen—the Agricultural Experiment Station of the University of Florida made the test, and says: "The grapefruit wrapped in **Pliofilm** showed little shrinkage as compared with the unwrapped fruit and no loss in flavor... original taste and appearance of the oranges were unchanged...carrots held their color perfectly, retained their firmness and vitamin content." And those carrots were there for *a year and a half!*

What's more, tests made with dozens of other fruits and vegetables yielded the same kind of sensational results.

THE EPILOGUE. Today, **Pliofilm's** role is that of a war-worker-only. But forward-looking marketers are planning *now* to star it in many a postwar packaging drama. Guardian of freshness, guarantor of lasting flavor, **Pliofilm** seals moisture *in*, seals spoilage *out*. And this unique material works equally well for cheese, meat loaf, sausage, coffee, nuts, pharmaceuticals, chemicals and other air-moisture-sensitive products. Makes top-notch raincoats, food-bowl covers, too. For further information, write: **Pliofilm** Sales Dept., Goodyear, Akron 16, Ohio.

To owners of G-E Air Conditioning, G-E Commercial Refrigeration

Give your condensing units room to breathe!

TO get the most out of your G-E air conditioning or refrigeration equipment, keep the floor clear around the condensing unit . . . give it the air it needs to do its job efficiently. Packing cases or debris piled near the unit shut off the supply of air . . . decrease the effectiveness of the equipment . . . may shorten its life when it can't be replaced.

Pass these three tips on to your maintenance man, too —they're simple jobs he can do himself to keep your equipment running for the duration:

1. OIL bearings regularly to prevent burn-outs. The instructions for your equipment will tell you what oil to use—and how much.

2. CLEAN cooling fins occasionally with a soft bristled brush. Dirt and lint cut down efficiency—and may hasten the wearing out of moving parts.

3. ADJUST belt tension and keep pulleys in alignment to prevent unnecessary wear on rubber belts.

These few precautions will pay for themselves in longer equipment life and better performance—and avert the need for service calls. But when your equipment *does* need expert service, call in the G-E service man immediately. Remember . . . for the duration your present G-E equipment is irreplaceable . . . so give it the best of care!

☆ BUY WAR BONDS ☆

SHUTTING DOWN YOUR AIR CONDITIONING SYSTEM FOR THE WINTER?

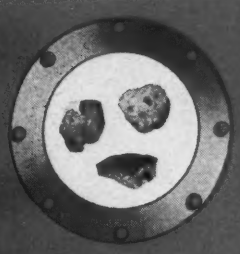
Then have a service man pump it down to keep it from developing leaks when not in use. If cooling towers (or other types of refrigerating equipment containing water) are located where the water may freeze, see that system is protected by draining or the use of anti-freeze solutions. *General Electric Company, Air Conditioning and Commercial Refrigeration Divisions, Section 38910, Bloomfield, N. J.*

GENERAL ELECTRIC

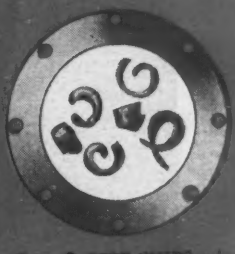
LISTEN TO THE GENERAL ELECTRIC RADIO PROGRAMS: "THE HOUR OF CHARM," SUNDAYS, 10 P.M., E W T, ON N B C . . . "THE WORLD TODAY" NEWS, WEEKDAYS, 6:45 P.M., E W T, ON C B S

LOOK HERE FOR VALVE SABOTEURS!

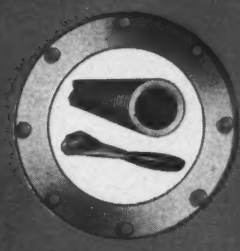
Prevent Valve Failure *before it starts!*



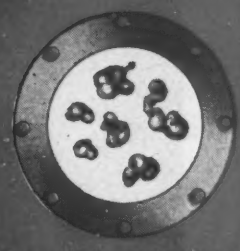
Case 1. PIPE SCALE clogs valves. *Prevention:* blow out or flush pipe thoroughly.



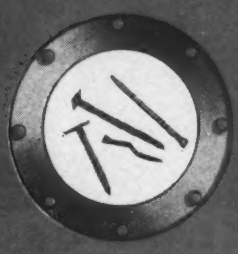
Case 2. PIPE CHIPS ruin valve seats. *Prevention:* Clean threads before connecting pipe.



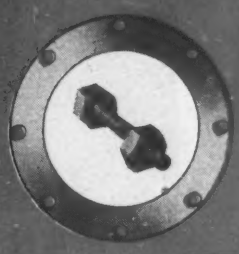
Case 3. JOINT COMPOUND clogs valves. *Prevention:* Put it on pipe threads only.



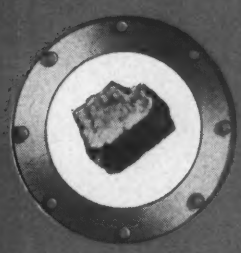
Case 4. WELDING BEADS ruin valve seats, prevent closing. *Prevention:* Blow out or flush pipe.



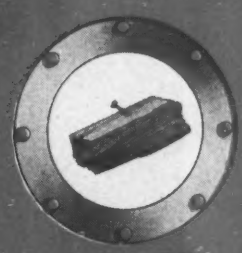
Case 5. NAILS jam seating gate valve. *Prevention:* Instruct workmen to clean lines.



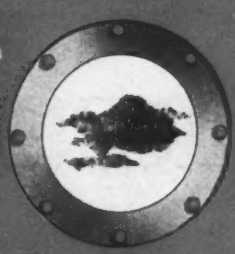
Case 6. BOLT and NUT lodge in gate valve seat. *Prevention:* Instruct workmen to be careful.



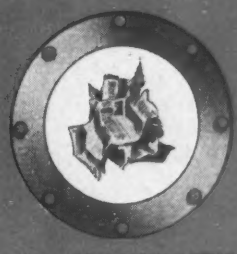
Case 7. BRICK stops flow through line. *Prevention:* Look before closing line.



Case 8. JOIST END prevents check valve closing. *Prevention:* See that new lines are clear.



Case 9. SAND and GRAVEL wear out valve parts. *Prevention:* Flush out lines.



Case 10. NEWSPAPERS foul a check valve. *Prevention:* Make sure lines are clear.

SAVE VALVES... Keep War Production Moving... See that Pipe Lines are CLEAN before they are closed

Records show that every one of these valve saboteurs has been caught in a pipeline . . . left there during installation or repair work. All have caused crippling shutdowns . . . some have ruined valves beyond repair.

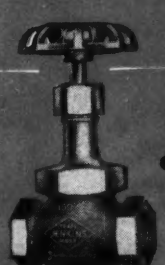
To guard against the constant threat of damage by these valve enemies, workmen must be taught to look into, and *through* every unit of a system before it is connected up. As a further precaution, thorough flushing or blowing out before the system is put into service is recommended.

Time lost in production slowdowns today interrupts the flow of vital war material to our fighting forces.

Slowdowns due to valve failure can be prevented, waste of critical valve metals greatly reduced, by effective valve conservation. See that your valves get frequent, systematic inspection. Repair or renew worn parts before a valve destroys itself. When valves must be replaced, have the new valves selected and installed by experienced men. Above all, train new workers to operate and maintain valves properly.

Consult Jenkins Engineers for any assistance you need in promoting valve conservation.

Jenkins Bros., 80 White Street, New York 13, N. Y.; Bridgeport, Atlanta; Boston; Philadelphia; Chicago. Jenkins Bros., Ltd., Montreal; London.

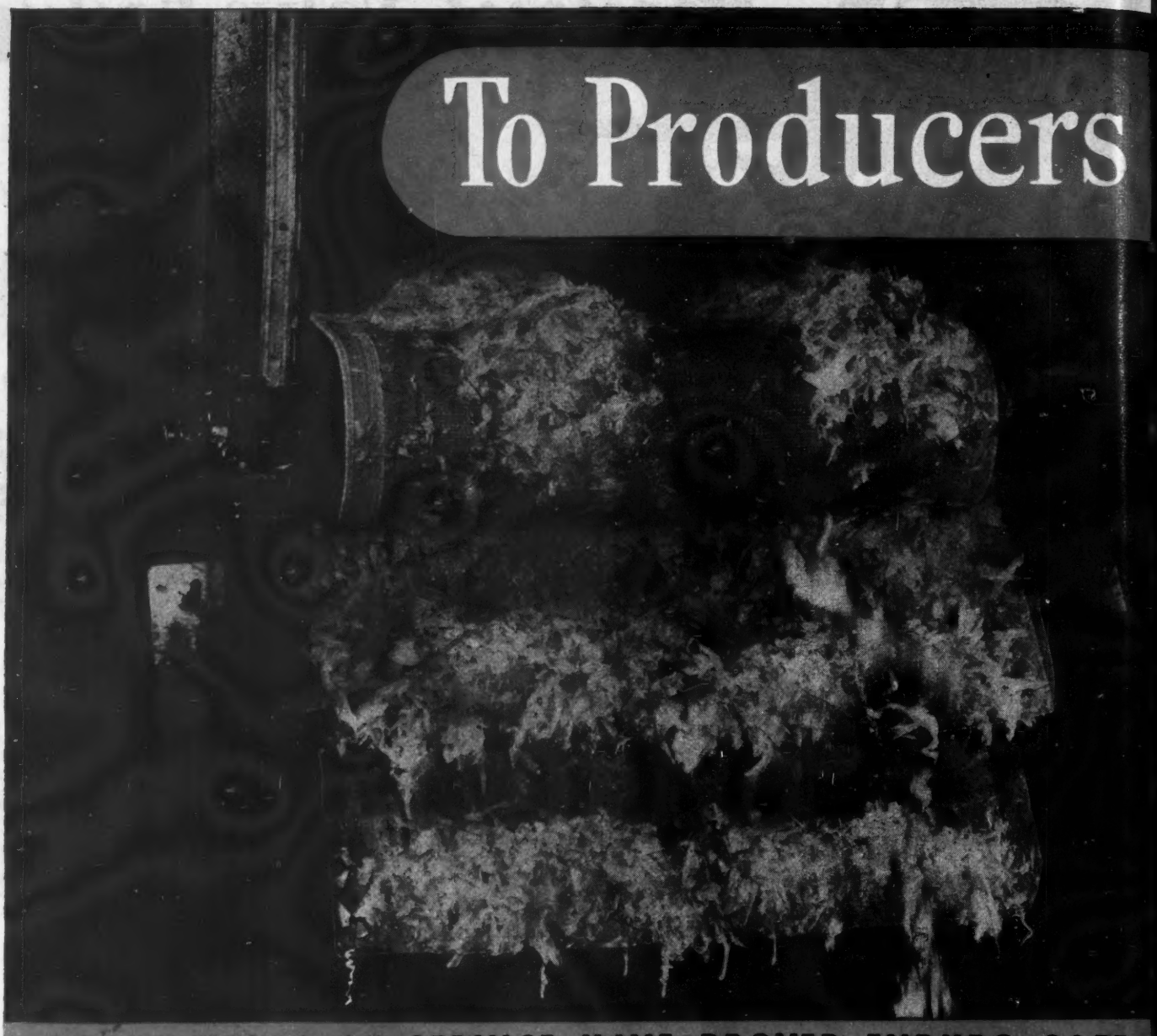


JENKINS VALVES

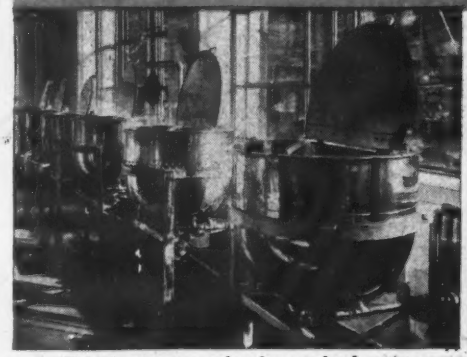
SINCE 1864

For every industrial, engineering, marine and power plant service . . . in Bronze, Iron, Cast Steel and Corrosion-Resisting Alloys...125 to 600 lbs. pressure.

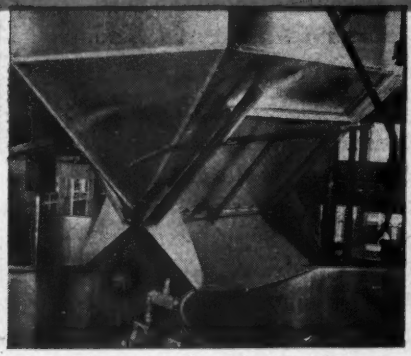
To Producers



MANY YEARS OF SERVICE HAVE PROVED ENDURO SAFE



This plant gets more batches per day by using ENDURO kettles for cooking fruit.



ENDURO measuring boxes, kettles and conveyors resist acids in this cranberry cannery.

Tons of ENDURO are now seeing service in all types of equipment in meat packing plants.

REPUBLIC *Enduro*

* Reg. U. S. Pat. Off.

Other Republic products include Ex-L-ite Tin Plate—Pipe—Sheets—

# of Dehydrated Foods

. . . THESE PERTINENT FACTS ABOUT REPUBLIC ENDURO STAINLESS STEEL!

Maybe you already are a user of Republic ENDURO Stainless Steel, and are familiar with its many advantages from first-hand experience. If not, here is a material that you should know more about.

ENDURO is not new to the food industries. For years, it has been helping to improve quality, increase production and reduce costs.

This finest of steels combines the inertness to foods of porcelain with the sanitation of glass and the strength of alloy steel. It does not contaminate nor alter flavor, color, composition or purity of fruit, vegetable and meat products. Neither is it affected by the corroding juices of food products.

ENDURO is as easy to clean as a china dish—thus increasing production by saving cleaning time between batches. It rarely requires more than a simple flushing with water and wiping. Should it be necessary to scrub off greases or sticky substances, ordinary cleaning compounds will not mar or harm its hard, lustrous surface.

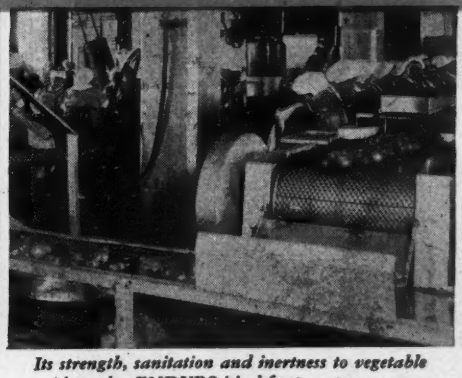
And ENDURO lasts indefinitely. It is tough, strong and resistant to abuse. It retains its finish, because it is solid stainless steel all the way through. It possesses high creep strength and resists oxidation—so it may be used safely and economically for all types of high temperature applications.

If you can qualify with the necessary rating, you can obtain ENDURO Stainless Steel now. In any event, you can be ready to use it when war production relinquishes its priority upon critical materials by writing us now for the full story of ENDURO in the food industries.

REPUBLIC STEEL CORPORATION
Alloy Steel Division, Dept. FI
Sales Offices • Massillon, Ohio
GENERAL OFFICES • • CLEVELAND 1, OHIO
Berger Manufacturing Division • Culvert Division
Niles Steel Products Division • Steel and Tubes Division
Union Drawn Steel Division • Truscon Steel Company
Export Department: Chrysler Building, New York 17, New York

AND ECONOMICAL IN ALL TYPES OF FOOD PROCESSING

Milk, a delicate product to handle, is unaffected in equipment of ENDURO.



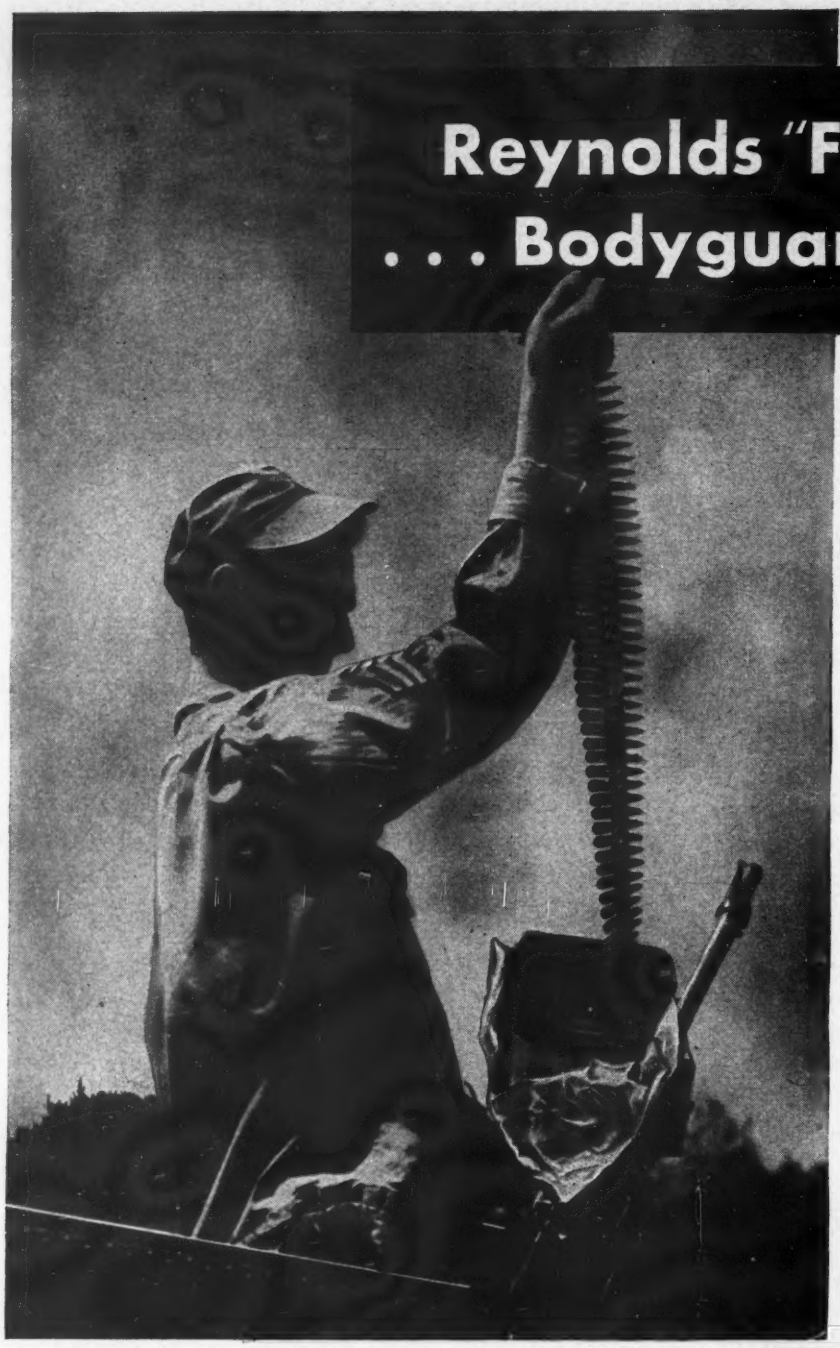
Its strength, sanitation and inertness to vegetable acids, makes ENDURO ideal for tomato conveyors.

ENDURO resists heat, too. Here it is used for ducts and heads on a 60-foot baking oven.

STAINLESS STEEL

Upson Bolts, Nuts and Rivets—Electrunite* Condenser and Heat Exchanger Tubes.

Reynolds "Fighting Foil" . . . Bodyguard for Bullets!



.30 caliber cartridges first see the light of day on the battle front, as a link belt of 100 is removed from its protective Reynolds casing.

100 cartridges to a carton—12 cartons to a case. 1200 rounds all Reynolds protected!

Ammunition arrives at base. Across oceans—through every element—as originally packed.

CORRODED BULLETS JAM GUNS! That's why Reynolds Metals "invasion-proof" packaging for .30 caliber aircraft ammunition is, today, serving on every fighting front—protecting cartridges against the invasion of dust, grit and moisture. It's air-tight, water-tight...giving *really armor-clad protection without the use of steel.*

This new wartime packaging is a solid sheet of metal foil laminated to varied processed materials and securely heat sealed. Truly "fighting foil"... developed by Reynolds...produced by Reynolds...and "battle-tested" on every worldwide fighting front, where it is now protecting foods, drugs, ammunition and supplies under every wartime condition.

Let Reynolds apply their extensive packaging research and experience to your own needs. Representatives available throughout the country.

Reynolds Battle-Tested Material Meets These Army-Navy Requirements

1 *Positive Protection Against Moisture-Vapor Transmission.*
2 *Immersion-Proof. Keeps Water Out!*
3 *Protection Against Insect Infestation, Odors and Light.*
4 *Substantial Saving in Tin, Steel and Other Strategic Materials.*
5 *Saving in Space, Especially Shipment and Storage of Empties.*
6 *Saving in Weight.*
7 *Serviceability Under Export Conditions.*

REYNOLDS ALUMINUM

REYNOLDS METALS COMPANY • FOIL DIVISION
GENERAL OFFICES • RICHMOND, VIRGINIA
America's Great New Source of Aluminum

IS YOUR FOOD PROCESSING EQUIPMENT COSTING MORE TO OPERATE AND MAINTAIN *than it should* ?

Get ready to meet post-war competition successfully; redesign your equipment to use more Timken Bearings.

WHEREVER there is friction in food processing machines there is bound to be wasted power; power you pay for without getting any work in return. The percentage of such power loss depends upon the number of friction-ridden points in any particular machine.

Food machinery needs the protection of Timken Tapered Roller Bearings as much as any other kind of equipment—not only against friction and wear, but also against radial, thrust and combined loads and misalignment of moving parts; for this increases endurance, which extends machine life and reduces maintenance cost.

What applies to the food machines themselves, applies equally to auxiliary equipment such as line shaft hangers and pillow blocks. The more Timken Bearings there are in your plant the higher the production and the lower the production cost.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

PROTECT "WAR FOOD" IN TRANSIT

Box car fumigation with Dow Methyl Bromide—that's the real answer to complete protection for vital wartime food shipments. Here is the most effective, practical and convenient method of fumigating loaded railroad cars.

Methyl Bromide is applied easily and quickly through a closed system from outside the car—eliminating the need for gas masks. It is released under its own vapor pressure without the use of complex or expensive equipment. Either the convenient 1 lb. can or regular Methyl Bromide cylinder may be used.

Methyl Bromide possesses exceptional penetrating qualities—power to reach into the very center of every bag and package. It effects a complete kill of all insects in either the egg or active stages. Applications in properly sealed cars insure food against infestation—assuring the delivery of insect-free products.

A new leaflet on "Box Car Fumigation" is now available. Send for it today.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

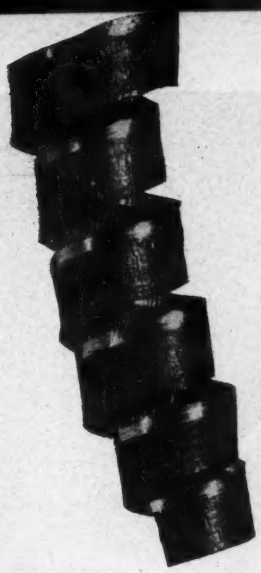
New York • St. Louis • Chicago • Houston • San Francisco
Los Angeles • Seattle

METHYL BROMIDE

THE PENETRATING FUMIGANT

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY



Only NON-CORRODING EQUIPMENT will find a Place in Better Food Plants of the Future

Plan now with IngAclad for the competitive days ahead

You know the advantages of stainless steel equipment, but you may not know that IngAclad Stainless-Clad Steel gives you perfect stainless service at so much lower cost.

For more than 10 years, this product of the Ingersoll Steel Division of Borg-Warner Corporation has served satisfactorily the leaders in many of America's Process Industries. Since Pearl Harbor practically all IngAclad production has gone into equipment for the Armed Services. Here it has served well, both by conserving large quantities of vital alloys and by providing non-corrosive equipment at lower cost.

Investigate IngAclad now. See how it can be widely used in your plant to improve appearance, to protect your product, and to lower manufacturing costs. Write for the Free IngAclad Manual of Welding and Fabricating Procedures.

A Typical Installation in the Food Process Industries

Beverage Syrup Storage Tanks fabricated of IngAclad for Iowa Foods Co., Iowa City, Iowa.

We Also Produce INGERSOLL Solid Stainless Steels

INGERSOLL STEEL & DISC DIVISION
BORG-WARNER CORPORATION
310 South Michigan Avenue • Chicago, Illinois
Plants: Chicago, Ill.; New Castle, Ind.; Kalamazoo, Mich.

INGACLAD
STAINLESS-CLAD STEEL

"A Borg-Warner Product"

We Also Produce INGERSOLL Solid Stainless Steels

"Can Death wait six minutes?"

AN American soldier lay critically wounded in a far-off field hospital.

To give him the best chance for survival, he was getting a blood-plasma transfusion.

The soldier would need about 600 cc's of blood plasma. The transfusion kits contained only 300 cc's each. This meant an interruption of from six to eight minutes, while the second kit was being rigged up.

So, there was a question in the doctor's mind: "Will this interruption lessen this man's chances for survival? Can Death wait six minutes?"

There was the possibility that such a delay could be dangerous . . . a small possibility. *But this was a chance the Army didn't want to take!*

Eager to take every possible precaution to safeguard the lives of our men, the Army asked for a larger container for blood plasma—one that would hold 600 cc's of this life-saving fluid.

Naturally, this was a request we were most happy to fulfill. And our realization that medicine won't take chances with human life—*ever*—turned a routine job into a thrilling, significant operation.

Some of the other products going to all branches of the service made by Canco are shell containers . . . demolition kits . . . TNT containers . . . complete torpedoes . . . hand grenades.

And, as always, American Can Company is very much in the business of making food cans. Last year, more food was packed in cans than ever before. Of course, a great percentage of this food is going to the armed forces.

For many civilian items, substitute containers must be used. Canco, with its department of skilled packaging engineers, is making various types of substitute containers as rapidly as possible.

CONTRIBUTE YOUR BLOOD

As you read this advertisement—stop and think—your blood could save the life of a wounded American soldier! If you live in or near one of the 33 cities in which blood-donor centers are located, call and make an appointment.

☆ ☆ **AMERICAN CAN COMPANY** ☆ ☆

230 PARK AVENUE • NEW YORK, N. Y.

Free Enterprise

WE MUST ACT TO PRESERVE IT!

LIKE a leaf floating downstream, we are being carried along toward a new and uncharted economy. What this new economy will be like will depend, to no small extent, upon what industry does or fails to do during the coming months. Time is short; in fact, we may suddenly find ourselves standing on the threshold of a peace economy with our war boots still on our feet.

While bending every effort to win the war, we cannot afford to be caught unprepared for the peace. As Prime Minister Churchill said at Harvard, we are "bound, so far as life and strength allow and without prejudice to our dominating military task, to look ahead to those days which will surely come, when we shall have finally beaten down Satan under our feet and find ourselves with other great Allies at once the masters and the servants of the future." Unless we do look ahead, there is danger that we may become neither the masters nor the servants, but merely the victims, of the future.

The war has quickened our ailing economy and opened our eyes again to the possibilities of peace-time plenty. But it has also brought great dislocations of labor and capital; it has led to abnormal patterns in prices and income distribution; and it has created inflationary pressures with enormous potential powers to injure or to help us in the transition from war to peace.

The pattern of life in postwar America will be just what we make it. All of us will have a hand in shaping that pattern, but business men will have a special responsibility in the reconstruction. As employers of labor and capital and as enterprisers assuming the risks of new ventures, they will have to plan and carry out the conversion from war work to full peace-time production. Because of their key role, business men have a special opportunity to discover, and to help others to understand, the conditions which are necessary if they are to do their job satisfactorily.

This is a narrow view of postwar problems but it is a central view, because no one condition is more vital to the health of the world than a high level of production and employment in the United States. We cannot hope to lead the world out of economic chaos if we fail to put our own house in order. If we fail to adjust our domestic economy, we may destroy Adolf Hitler; but we will not destroy the germ that breeds "Hitlers." If we do not maintain the production necessary for supporting a large volume of imports and exports, then the plans for international monetary stabilization, for good relations with our neighbors, for rehabilitation of stricken countries, and for strengthening the democratic bulwarks against dictatorship are all likely to come to grief. We must demonstrate our capacity for world leadership, or be content to follow the leadership of others.

The prospects for achieving a sound and vigorous economy in the United States are not so good as to warrant complacency on the part of men genuinely interested in free enterprise and the political freedoms incident to it. We have yet to find means to utilize our vast and abundant resources for the good of all. We have yet to learn how to keep men from the terrible experience of unemployment and the fear of want which makes them willing to sacrifice freedom and opportunity for almost any promise of security. We have yet to reconcile the conflicting interests of labor, agriculture, and business so that they can work together effectively. We have yet to learn how to check the fever of inflation and cure the palsy of depression.

When we were attacked at Pearl Harbor, we realized our physical peril immediately and united in a tremendous common effort against the enemy. The onset of economic perils is less obvious. No bombs will signal the deterioration of the private enterprise system, the extension of regimentation, the further control of busi-

ness by government, and the concentration of political power in less and less responsible hands. If these things should befall us, they will come insidiously while we are preoccupied with self interests and oriented by popular misconceptions. If the freedoms of the individual shrivel as the state grows in power, it will be because the individual is too indifferent or complacent to concern himself seriously with economic problems. If our people are misled by false prophets and demagogues, it will be because business men did not understand economics, because scholars were too ignorant of practical affairs, and because we failed to produce economic statesmen of sufficient stature for the task in hand.

Thinking is hard work. Thinking about things outside our personal experience, about economic processes that are broader and in some fundamental respects different from buying and selling or running a business – is strenuous mental labor. Thinking straight about problems that are beyond our personal and immediate status and our pocketbooks, thinking about problems that involve nation-wide production, nation-wide employment and nation-wide buying power – in other words the operation of our entire economic system – involves real self-discipline. Yet there is no other way to safeguard our freedoms. We cannot rely on trial and error; tinkering takes too long; social experiments which turn out wrong can be undone only at great cost – if at all. If we proceed blindly, we shall flounder into an economic and political morass from which we cannot escape.

We floundered badly all through the Thirties, until the war lifted us temporarily to higher ground. When the war boom is over, we shall be back floundering worse than ever unless we find a solid road along which to proceed.

America has grown rich and strong under a system of political and economic freedom. Opportunity and the necessity of self-reliance have brought forth great accomplishments. The hope of profit and the spur of competition have urged men on to find new and better products, new and better methods, and to risk their savings in pioneer investment. Never has a country achieved so high a standard of living and afforded so large an opportunity for the individual man and woman. It is not surprising that some distinguished business leaders, looking back over their own experience, tell us that everything will be all right if only there is "less government in business."

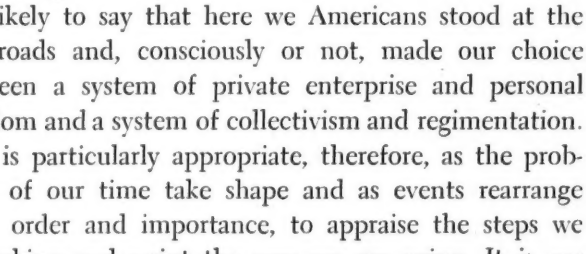
I wish the solution were as simple as that. However this is only part of the answer. It is becoming increasingly clear that industrial capitalism as we know it contains within itself certain fundamental weaknesses which can lead to its destruction if they are not counteracted. No democracy can survive when twenty to thirty per cent of its workers cannot get jobs. That happened here in the Thirties. For years on end, despite fumbling efforts at recovery one out of every five workers was denied a chance to earn a living in private business. We shall never again have such mass unemployment as occurred in the bottom of the Depression, because the government will take it upon itself to create jobs if business cannot offer them. Whenever that happens, however, the area of private enterprise will be reduced and that of government will be expanded – and the concentration of political power will be increased. This is the challenge we business men face today, and ours is the first opportunity at finding the solution.

The crux of our economic problem is unemployment. Unless there are jobs for ninety to ninety-five per cent of those who are able and willing to work, there will be widespread fear and lack of opportunity, which will drive labor unions, agricultural groups, and business interests to take self-protective measures. Such measures are certain to restrict production, stifle progress, and imperil our democratic way of life. Not all our problems will automatically be solved if we learn how to avoid mass unemployment, but they will at least then have a good chance of solution.

And so American businessmen face a great responsibility! We will have to find the answer to a great many momentous questions. We will have to delve into problems that cannot be solved by precedent.

Looking backward to these times, future historians are likely to say that here we Americans stood at the crossroads and, consciously or not, made our choice between a system of private enterprise and personal freedom and a system of collectivism and regimentation.

It is particularly appropriate, therefore, as the problems of our time take shape and as events rearrange their order and importance, to appraise the steps we are taking and point the way we are going. It is my plan to present such analyses from time to time to the one-and-a-half million readers of McGraw-Hill publications.



President, McGraw-Hill Publishing Company, Inc.

FOOD INDUSTRIES

FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

LAURENCE V. BURTON, Editor

OCTOBER, 1943

Post War Planning—III

Preparing for Distribution Requires Planning Now

A MAN who is regarded as one of the ablest students of distribution problems in the food industry once told me something I shall never forget. We had been discussing a lot of things pertaining to distribution when I asked, "Suppose your selling price is above the idea of the majority of distributors and you, yourself, are convinced that you are above the market, yet you can't reduce your price without losing all your profit—what do you do then? Is there any trick of distribution, salesmanship, or advertising that can be utilized to save your position—to hold the volume at a profit?"

"Oh, nonsense!" was his reply, "there is nothing mysterious about distribution problems. It's all commonsense. When the time comes to face the problem you describe then I look to the production department for lowered costs so that I don't have to utilize costly forced-draft selling methods to move our goods."

"Go on with that idea and develop it further," I encouraged him.

"Well, its this way. The most acute problems of distribution and selling come to the fellow with the highest production costs. I like to have the position of having production costs below the average, if not the lowest of the industry. Naturally, I don't want to be an above-the-average cost producer. I would prefer to be the lowest cost producer.

"Selling prices must not, however, be confused with costs of production. Selling prices should gradually be lowered for the good of the national economy. But if I lower my selling prices unwarrantedly, or too precipitously, the competition may be forced to restudy their production methods and they might be smarter than our folks. They might discover something wholly new that would unexpectedly leave us as a high-cost producer instead of the lowest cost producer. And, furthermore, they might patent it. The most comfortable place to be is below the average. When you are there, the other fellow can't bother you very much.

"How can you tell when you are on the safe side of average cost of production?"

"That," he answered, "is very difficult but not impossible. We have a department that constantly gathers all the information possible and in that way we know pretty much how we stand with respect to competitors' manufacturing costs. Whenever we realize we are average, or above, then the research department is called on for scientific and engineering studies. In due time research always discovers some way to get our costs down on the item in question."

"Then, if I interpret your thinking correctly, the answer to many distribution problems lies not in the sales department, but in the production department?"

"Exactly."

"Would you say that *all* distribution problems can be solved by the production department?"

"Definitely no," was his emphatic answer. "No amount of salesmanship can compensate for production errors, defective goods, or costs that are too high. On the other hand, nothing that the production department can do can compensate for distribution errors such as ill-advised credits, wrong types of outlets, selling methods that alienate the trade, or distribution schemes that leave goods too long in the trade, or advertising that does not sell. But I will say this: The manufacturer who tries to solve all his distribution problems by things that only the sales department can do is overlooking his best bet. If he forgets that his production department very likely can produce the answer, he is like a man in a fight who forgets he has a left hand and feet."

That conversation took place several years ago. It was sound peace time manufacturing philosophy. It came from a man who knows his stuff. He is acknowledged by nearly everyone to be about the smartest merchandiser in the food field.

But what most folks don't realize is that the man who has costs below the average is a man who has an enviable freedom of action. It means that over half his competition can't do much to hurt his trade without losing money in doing it.

Application to Post War Problems

What does this mean to post war planning? By its very name, post war means peace time, and the preceding story relates to peace time which, some day, will come again. Commonsense will tell you that it is impossible for all the firms in an industry to have costs below the average of that industry. The conversation I have related does, however, have a most important lesson for all who want to be ready to meet the problems of peace time.

Studies made by Food Industries about ten years ago revealed that the industry had too large an excess or unused capacity. It was found that few indeed were the plants or corporations that could operate on less than capacity volume without running up the cost per package (the unit-costs) to figures that were too high to break even. And they couldn't get that volume without damaging price cuts.

It is said that U.S. Steel Corporation has been so built up that it has its lowest unit-cost when operating at about ¾ capacity. Projected new hotels and large apartment houses are usually figured on 60 percent average rentals. Space is alloted to rooms, and departments are so organized, and prices are assigned so that, when only 60 percent of the possible occupancy is taken, the place can make a fair net profit.

Why not apply that thinking to food manufacturing companies?

Wouldn't it be a smart move for every company to begin to figure right now on how it could operate profitably, perhaps most profitably at, say, 70 percent of capacity? Or to put it another way, wouldn't it be a very sensible move to plan to make a part of the production equipment of such excellence that it would produce at costs lower than the average for the industry, and another part at average cost, while the rest could be the old equipment that was really higher cost?

Unlike any other industry, the food industry as a whole will not increase its total volume at lowered prices. You can sell two pairs of shoes, two radios, two suits of clothes and so on to a man, but you can't sell him two meals at once. But he can be encouraged to eat more properly if good food is within his means and he can have enough money to pay for it.

Here is how I would do it if I were running the affairs of a company. Let's assume that it has three production lines in a single plant. One of my first moves would be to put someone at work to determine what could be done in the future to make one of those lines a really low-cost producer. This would insure that at least a half of my 100-percent capacity volume would be at a profit in the post war days, for usually a low-cost line is a high speed line.

I would expect all sorts of objections from my associates, who would probably tell me that the entire equipment field had been canvassed long ago and nothing could be better than what we already have. To which I would reply, "Maybe so, but are we using available equipment to the best advantage? Isn't there a different way that would be more efficient?" I would insist on all sorts of unit-operation studies to see how many man-hours, kilowatt-hours, B.t.u., or dollars it cost us to do each and every operation in the plant. Only then would I feel that I had enough data to go on when something new came up for a decision. (The matter of quality and flavor is not forgotten; some future issue will cover it.)

The research and engineering departments would be assigned the tasks of:

1. Estimating how much total cost could be saved if the unit cost of each operation were cut by half or two-thirds;

2. Either designing or locating a source of equipment that would do the foregoing. I would give considerable encouragement to designing a continuous process for the production. In fact, unless we already had a continuous process, I would work in that direction from the outset. For continuous processes are the lowest-cost producers and they produce the best and most uniform quality.

3. I would call in consultants to help study some aspects of the case, making the necessary arrangements in advance that any patentable inventions would be assigned to the company.

4. Next, I would have the research department build a pilot plant to test out the new process at as early a date as possible, building it out of junk, old equipment, and temporary makeshifts unless, perchance, suitable WPB priorities were available at the time. The pilot plant operation would be studied until all the engineering bugs had been discovered and worked out, and the sales staff were satisfied with the product.

5. The final step in this bit of post war planning to solve future distribution problems would be to have complete working drawings and specifications prepared. These would be put into the safe until there was a let-up in war's demand on metals and metal working industries that could fabricate the design. In fact, these plans might be held in abeyance until there was a post war slump in the heavy industries, for that might mean cheaper fabricating costs.

Solving Tomorrow's Problems Now

The same sort of planning could also be applied to the affairs of a company which owned several plants manufacturing the same products. Or, depending on their geographical location, the decision might be to make one of them the low-cost producer.

Regardless of detail, however, the basic idea would be to get the firm out of the situation where nothing but full capacity operations could be profitable when the going is tough. I suggest this because this is a dangerous situation. It leads too often to concessions, free deals, and unwarranted price cuts in order to keep up the volume so as to get some profits to give away in the vicious circle.

If all firms in the food field would begin now to plan for solving future distribution problems on a rational basis as outlined, the uncertainties of the post war period would be much easier to face. And some of the distribution problems would be solved in advance. Food manufacturers cannot increase the total consumption of food per capita. All they can do is sell more or less of a single food by virtue of its cost to the consumer in relation to the cost of other foods.

L. V. Burton EDITOR

The Talk of the Industry

Affairs of Columbia Conserve Co.

William P. Hapgood, and his late brother, Norman Hapgood, tried for 18 years to develop a true industrial democracy in their Columbia Conserve Co. in Indianapolis (see "Employees See the Balance Sheet Every Week," by Norman Hapgood, FOOD INDUSTRIES, vol. 6, 294, 1934). But their efforts have come to naught as a result of a court decree in July after the long trial, and hereafter the affairs of the company will be run like an ordinary corporate business. In principle the employees were helped to buy stock and were allowed to set their own wages and elect their own directors. Of the common shares, 63 percent were held in trust for the employees to be paid by earnings above 7 percent.

In the worst of the depression employees put their own wages down to $9 a week, but some malcontents among the temporary employees protested vigorously, averring that no one could live on $9. To which one of the old timers retorted, "Did you ever try to live on nothing?" The AFL investigated and withdrew.

The block of stock owned collectively by the salaried workers of the company has been ordered distributed to them individually and the idealistic dream has ended because a few had charged the officials with mismanagement.

Though the court held that the firm had not been mismanaged, it ordered distribution of the stock. Apparently a cooperative venture must spring from the ranks. It does not seem to work well by bestowal from above.

Low-cost Protein Food —Postwar Opportunity

In the chaotic conditions that will follow the cessation of actual fighting some years hence, there will be many forms of problems for the food manufacturer. To be ready for them the researchers should begin now.

These problems will be centered around the need for low-cost protein foods for low-income consumer groups. And one suspects that taxation will place all of us in this category. On reflection it becomes apparent that low-income consumers cannot pay high prices for meats—at least not for very much meat, and certainly not for any 130-lb per capita quantity.

To explore the agricultural-economic phases of such a trend is not within the province of this commentary. But it is within our province to point out that low-cost proteins are all of vegetable origin, especially from soybeans, the germs of cereal grains, and grasses.

Foresighted manufacturers will begin to study these sources of low-cost proteins to learn how to produce palatable commercial foods from them that will appeal to the mass markets. (We are going to keep on living regardless of our national debt.)

To develop such new foods from unaccustomed raw materials is a long-time job. So if research departments have time or personnel for another project in the near future, it is recommended that the work be started and kept going. In the course of several years of effort, it is likely that there will emerge many new foods of exceptionally good taste that will make possible adequate nutrition.

Elementary Public Relations —Visitors Not Allowed

There is an old saw that says: People who live in glass houses should not throw stones. Its current counterpart would be: Firms that don't allow visitors should not do any work out of doors. At least this idea came to us when a very well known American asked us to explain how a well known firm was permitted by law to get away with certain practices in an open yard adjacent to its plant.

It seems that this company will not allow anyone inside the plant. But its incoming raw materials are washed outside, in plain view of anyone, by a recirculation method that accumu-

Hors d'Oeuvres

• The Japanese soldier in the field eats a highly nutritious, scientifically balanced diet which is considerably better than the customary diet of the Japanese civilian. Kind of like the last meal for the condemned.

• *Meatless Tuesdays, a survey indicates, actually do not reduce the consumption of meat for the week. No matter how you slice it, it's still only a pound of baloney.*

• Lord Woolton, Britain's Food Minister, buys $2,670,000,000 worth of food a year for the 47,700,000 people. He loses $800,000,000 a year by giving some food away and selling some below cost, but the average Britisher has a better balanced diet than before the war. The British have always been adept at turning catastrophe into a cantaloupe.

• *Women are solving the manpower problem, but not without some unlooked for results. They raise morale in the plant by causing the men to perk up and spruce up. But the increase in workshirt laundry bills and the wear and tear on razor blades is getting terrific.*

• The demand for shark meat, a food tasted by few Americans before the war, has suddenly grown to such proportions along the eastern seaboard that fishermen are unable to fill their orders. Now wouldn't it be just too bad if we ate all the sharks and the species became extinct?

• *Soldiers in domestic training camps are now eating about four times as much fresh fish as the average civilian, and it is predicted that this new eating habit may carry over after the war. Could be, but if overworked, the fish eating habit might well swim in the other direction, a la the canned willy of 1917–18.*

• Central American bananas, dehydrated by a U. S. company, will be flown nearly half way round the world to help bring back the health of the Russian children who went through the siege of Stalingrad. It would take more than dehydrated bananas to bring back the health of most of the Germans who were at Stalingrad.

• *Goebbels would be surprised to learn that our soldiers are doughnut eaters. He thought they were cake-eaters.*

• A health officer says that it is a good thing that women leave lipstick on the rims of glasses in bars and cafes, as it forces the bar and cafe owners to see that all glasses are properly cleaned. Yes, lipstick in the wrong places does denote carelessness.

• *Bond for bomb, we've got to beat the Axis.*

F.K.L.

lates a very heavy load of organic matter and mud. By nightfall the "wash" water has the consistency of a thick soup. In attempting to rationalize the procedure, we expressed the opinion that the visible washing was merely preliminary to a more thorough washing with clean water that would be carried on inside the plant.

But, because visitors are not permitted, the well-known American was unconvinced. It would have been better for the firm's reputation either to have done all the washing inside, or use clean water outside, or else allow visitors to see what supplementary washing was done inside.

A further comment is that this company is one of those which mistakenly believes that public relations can be controlled by a publicity man who can spend lots of money while the executives continue to do as they please. It is well to remember that events, not words, influence public opinion.

Do You Want Our Annual Index?

With paper rationing increasingly severe, FOOD INDUSTRIES must conserve still more paper. To accomplish this we propose to stop binding the Annual Index into the December number.

Those who bind their annual volumes will, of course, need the Annual Index, but to get it you will have to write to this office and order it before November 15, 1943.

We figure we can save 104,000 pages of paper by omitting the Index. Those who want it will be provided one free copy if they order before printing time.

"Food Fights for Freedom"

Amid all the current drives for War Loans, U.S.O. funds and the various charities, no food manufacturer should overlook his equally vital part in the "Food Fights for Freedom" campaign that is now starting.

All food companies are asked by the War Food Administration to tie in their own advertising to this campaign. As planned by the War Advertising Council, the campaign is to be in high gear by Thanksgiving Day. That date, however, is not the end of the campaign. On the contrary, it is to be only "the end of the beginning."

Public opinion must be educated to the vital job to be played by food in 1944. For, if we fail on the food front the military victories may be more than offset.

You are urged to help the campaign, yet the War Advertising Council wisely says your tie-in is asked only if you can also help yourself by helping the "Food Fights for Freedom Campaign."

Don't Neglect Sanitation

One feature of the "Food Fights for Freedom" campaign overlooked by the War Food Administration planners is the role of proper sanitation in the conservation of food. There is no need to remind any qualified food technologist of the potential cause of loss of good food.

Others, however, should recall that food plant sanitation is merely the sound tactics of mankind in his battle to get the food before some other critters get it, such as: bacteria, molds, yeast, insects, rodents, or even higher animals.

Proper sanitation of our places of industrial production and storage of foods is as much a part of the food campaign as educating the public to use food wisely.

A Wise Move

H. J. Heinz Co. has made a very wise move in educating all its employees through the pages of its house organ "The 57 News" as to the true meaning of the efforts of Washington to bring about grade labeling on a compulsory basis. That grade labeling puts a ceiling over quality instead of a floor under it, is the theme of the educational treatment.

Here is a course of action that all food manufacturers would do well to imitate with their own employee groups. For every employee is a food consumer and the food industry employs a million of them.

What, Pray, Is Food Processing?

Confused thinking and talking in Washington, that calls farming food production and processing distribution, is further confused by OPA's "Ration Order 13, including Amendment 50" published Aug. 10, 1943, in *Federal Register* pages 11,048 to 11,079. If the authors of that gem of technological errors had even consulted the unabridged dictionary they would have avoided some of their blunders, deficient though the dictionary may be on technological nomenclature.

Obviously, we cannot quote the entire text of that 31-page document, but here are a few OPA contributions to misinformation:

"Article III Sec. 3.1 (1)

"A person produces processed foods: (i) If he bottles, cans or packs fruits, fruit juices, vegetables, vegetable juices, soups or baby foods in hermetically sealed containers and sterilizes them by the use of heat, or (ii) If he packs and freezes fruits or vegetables; or (iv) If he packs fruit or vegetable juices from containers over one gallon into hermetically sealed containers of one gallon or less and sterilizes by the use of heat; or (vi) If he precooks dry beans, peas or lentils...

"Note: Not all items in the above groups are processed foods as that term is defined. For example, fruit and vegetable juices packed in containers over one gallon are not processed foods. Canned olives are not processed foods..." quoted from page 11,053.

"The following foods are not 'processed foods' as that term is used in this order: Apple cider, apple juice, ...bullion cubes and powders, bread or cake with raisins including brown bread, candied fruits, cane sirups, capers, cereals, chocolate sirup, clam broth, condiment sauces (other than those containing a base of tomato products), corn-on-the-cob (hermetically packed), corn sirup, dehydrated vegetables (hermetically packed), jams, jellies, marmalades . . . health foods . . . milk . . . mustard . . . peanut butter...pickles...soy sauce... spaghetti...vegetable seasonings including liquid and salts." (Quoted from page 11,079.)

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WILL the master minds of OPA tell us how to produce any of the excepted foods without the use of food processing equipment and procedures?

If RO 13 were anything but an official government order, RO 13 would be nothing but ridiculous. But, because it is official, it establishes a dangerous precedent. And technologically it is false and misleading.

OPA is invited to justify its technological reasoning.

If You Want That Army Order, Here's the Right Procedure

As in getting any new business, you have to know where to go and whom to contact. This article tells you, and it explains the various steps that must be taken before a food product is accepted. The information comes from official sources

IN two short years the Army of the United States has become the largest purchasing agent ever known, and the responsibility of maintaining the reputation of having the best-fed army in the world is vested in the Office of the Quartermaster General.

Satisfactory handling of the problems concerned with foods in the Office of the Quartermaster General requires the most intimate and detailed knowledge of all types of available food products. It also requires an accurate up-to-date picture of all improvements in food products, the immediate appraisal of new food products, and news of the development of such new food processes as may have special significance to the Army.

For those companies now producing some of the hundreds of food items used for our fighting men, the paths to be followed in getting an Army order are well known, but there are other food processors to whom such advice would be helpful.

To keep step with the country-wide developments in food plants and laboratories, the Office of the Quartermaster General readily accepts for testing and evaluation any food products which appear to have real significance. But a certain procedure should be followed by the processor in placing his product before an Army testing board. This is important to Army officers because delays, misunderstandings and false starts waste time in interviews, letters and telephone calls on lines which are taxed to capacity.

Where To Go—Whom To See

This article should clarify, for those who have food products in which they feel the Army will be interested, the organizational relationship existing between the two Subsistence units in Washington and the QMC Subsistence Research Laboratory in Chicago. Frequently, manufacturers ask, "I have a product that I think the Army would like. Where do I take it—to Washington, or to Chicago—and whom do I contact?"

Brig. Gen. Carl A. Hardigg, Chief of the Subsistence Branch, Office of the Quartermaster General.

The answer is very simple, and can be stated in two sentences:

1. If the item you have falls within an existing specification, it should be referred to the Subsistence Branch of the Storage and Distribution Division, Office of the Quartermaster General, Washington, D. C.

2. If you have a new item—one for which there is no specification—it should be referred either to the Research and Development Branch, Subsistence Section, Office of the Quartermaster General, Washington, D. C., or to the QMC Subsistence Research Laboratory, Chicago, Ill. You can get a definite answer at either place.

The Chief of the Subsistence Branch is Brig. Gen. Carl A. Hardigg, who is located in Room 1003, Temporary C Building, Washington, D. C.; the Assistant Chief is Col. Paul P. Logan; Gen. Hardigg's executive officer is Col. Robert F. Carter.

If you are concerned with a food product under group 1, and have been in the habit of contacting Colonel Webster or one of his product specialists, well and good; if not, General Hardigg, Colonel Logan or Colonel Carter will either see you personally or refer you to Colonel Webster's office.

The Chief of the Research and Development Branch of the Office of the Quartermaster General is Col. Georges F. Doriot. The Director of Research is Dr. Bernard E. Proctor, Room 1102, Temporary A Building, Washington, D. C. The Quartermaster Corps Subsistence Research Laboratory, under the direction of Dr. Proctor, is headed by Col. Rohland A. Isker. This is located in Chicago because of its proximity to a large part of the food industry. Dr. Proctor's office is located in Washington, since it is in Washington that the decisions are made.

A new product may be taken either to Washington or Chicago, as it will eventually clear both places. Chicago conducts much of the laboratory research work, the development and testing necessary on all items, makes recommendations and initiates specifications. These are sent to Washington for approval by General Hardigg and Dr. Proctor. A manufacturer with an item to sell can get a definite decision at either place, and there is complete clearance and interchange of information between Chicago and Washington.

Col. Paul P. Logan, Assistant Chief, Subsistence Branch.

Sgt. Henry Ingram of the Quartermaster Corps selects commercial samples of foods that have been submitted by various manufacturers. These samples will then go to the research laboratory to determine the quality and vitamin content.

Here's What Happens

Let's take two parallel cases and follow them through: The Jones Manufacturing Co. and the Smith Products Co. both have new items—for which there are no specifications—which they think will interest the Army. They want an order with a minimum of red tape and delay. Jones takes his items to Washington; Smith takes his to Chicago. Here's what happens:

1. Jones has no contacts in Washington, so he secures an interview with Dr. Proctor, whose address is given above, or with one of Dr. Proctor's assistants, who has authority to act. Jones will get an answer right away as to whether or not the Army is interested. The item may be referred to Chicago for further development and test, or the manufacturer may be asked to make some changes or improvements in the item before it goes to Chicago. In either case, it will eventually go to Chicago for any tests necessary, and for the preparation of specifications, if necessary. If Chicago doesn't agree with Washington regarding the item, they'll say so, and give their reasons, so that a final decision may be made. If they do agree, specifications will be written and sent to Washington with a report of their findings and recommendations and samples of the product.

2. Smith goes to Chicago. He has no contacts, so he asks for Colonel Isker. If Colonel Isker can't see him, there will at all times be responsible personnel there who can give him an answer as to Army interest. Chicago will initiate all the development work necessary to the writing of specifications. Upon completion of the work, specifications, samples and the research report will go forward to Washington as in the case of the Jones product.

3. The samples and report, upon receipt by the Research and Development Branch in Washington, are taken before a test panel consisting of representatives of Research and Development, Subsistence Procurement (purchasing), Menu Planning, Baker's and Cook's School, the Navy, and others. The test at this panel is primarily organoleptic, but because of the diversified viewpoints of the members of the panel, it is also a quite thorough test of the practicability of the item as well. Assuming acceptance by the panel, the specifications are then sent to the technical men in both the Subsistence and the Research and Development Branches for comment or concurrence in the details of the specifications. These comments are then sent to Chicago, where the specifications, with suggested changes incorporated, are formally issued to the trade.

4. Based on these specifications, the Procurement group, through the depots, sends out invitations to bid.

Jones and Smith will be included in the invitations to bid, of course. But what about the fact that they have spent a great deal of time and money developing the product, and now are placed on a competitive basis with other manufacturers who have done nothing in the way of development? The Army, as a general rule, buys on competitive bids, based upon a published specification. This rule can be changed when a good reason exists for doing so, and, more frequently than not, educational orders are granted on new items. In addition, the developing manufacturer usually has an inherent advantage in equipment and technics, and if he has invented an item which is patentable, this advantage also accrues to him. Fairness is the guiding rule in all cases. The Army clearly recognizes that fairness is essential in obtaining new subsistence items and in retaining the cooperation of industry if our Army is to continue to be "the best fed in the world."

Four Valuable Suggestions

For the food manufacturer who has a product he wants the Army to buy, these four suggestions may save a great deal of time:

1. Decide whether the product fits within a published specification or whether it is a new product. This will determine whom to see.

2. It is preferable, but not absolutely necessary, to write for an appointment. There will be in Chicago and in Washington at all times someone with authority to give a decision. If you have not written, be certain to telephone for an appointment as soon as you reach Chicago or Washington.

3. Take at least five samples of the product with you.

4. Take technologists with you. The Research and Development Branch is generally allergic to unsubstantiated claims made by sales departments. Facts, not claims, are necessary. Questions will be asked which only technical men can answer, and no elaborate presentation is necessary.

It Takes a Little Time

From the viewpoint of the man in the food industry, his product is undoubtedly the most important in the world. But the staff in the Laboratory and in Washington has many things to worry about, often under pressure. Every consideration will be shown the man in the industry, and every effort will be made to expedite development and a decision on his product, but it can't be done overnight. It is impossible to hurry a storage test or an incubation test.

By and large, the Army doesn't dare accept tests without investigation. The Army must be certain before products are sent off to New Guinea or to the Aleutians, where items may have to be stored from 6 to 18 months before being used. Under such conditions, adequate tests take time, so don't be impatient. The Army isn't asleep—it's careful. It has to be careful because mistakes are too costly.

You can help by keeping in mind the above suggestions, which may save time, mistakes and your own peace of mind.

Model Food Plant Designed

Meat plant men draw up plans for a model hog cutting plant as part of course in sanitation. Ideas apply to other food plants

By **A. E. ABRAHAMSON,**
Department of Health,
City of New York*

FOOD handling in peacetime has left much to be desired from the health aspect and has been recognized as a problem by many progressive health officials and business men. To help meet this problem, courses in food handling methods and discussions of the health aspects have been conducted by the health departments of many cities. A course of this type was given this summer by the School of Engineering of Manhattan College in cooperation with the Department of Health of the City of New York and under the sponsorship of the U. S. Office of Education. The classes in this course were arranged by industry so that the men engaged in the meat industry met together, as did the bakers, confectioners, milk plant operators and others.

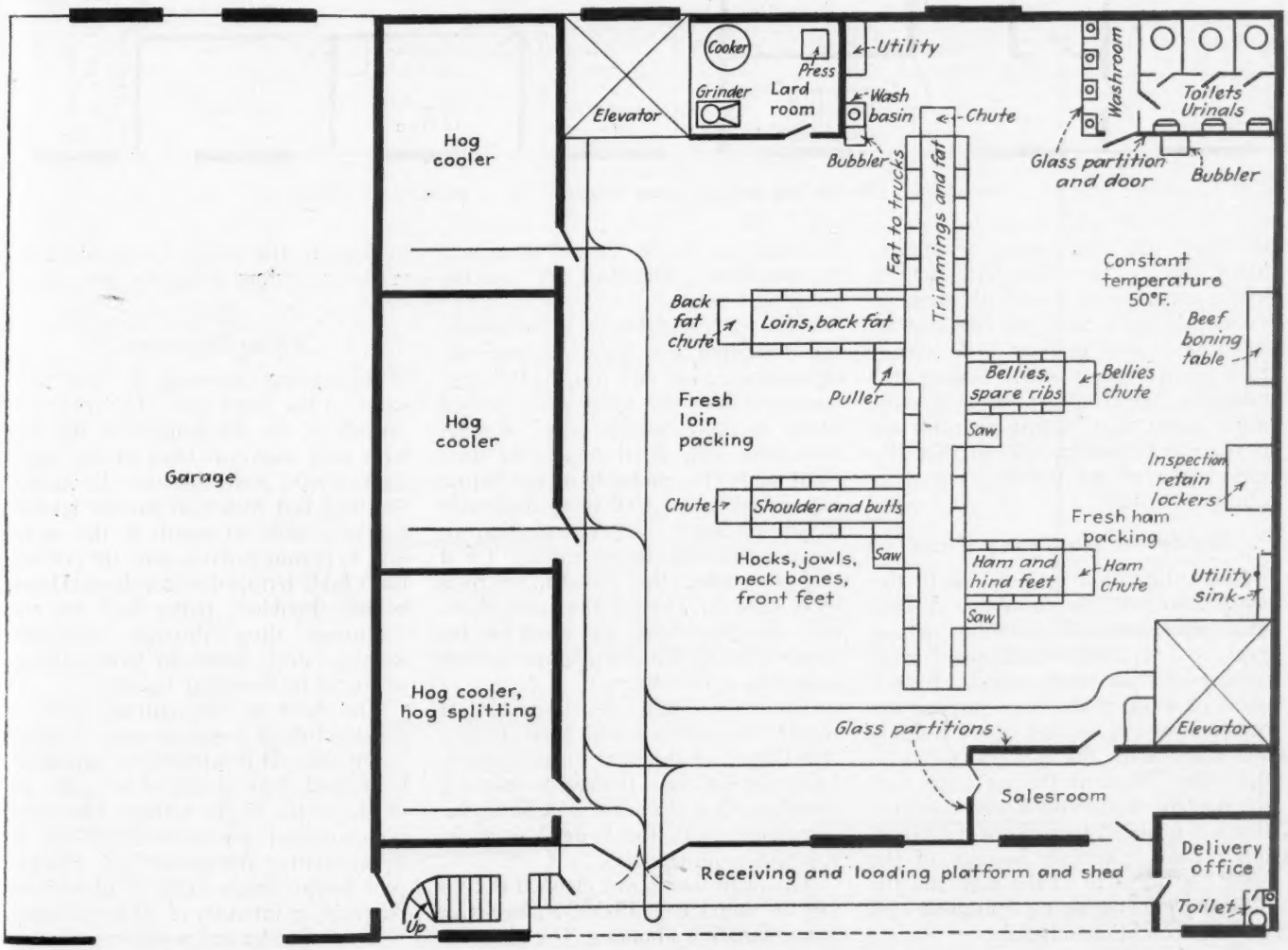
As part of the meat industry course, the class worked out the design for a model hog cutting and processing plant, the floor plans for which are given in the accompanying drawings. The men in this class were owners of small meat plants or supervisors and executives of larger meat packing houses in New York City.

These men help produce a sizable quantity of meat products in normal times. The pork packers particularly were well represented.

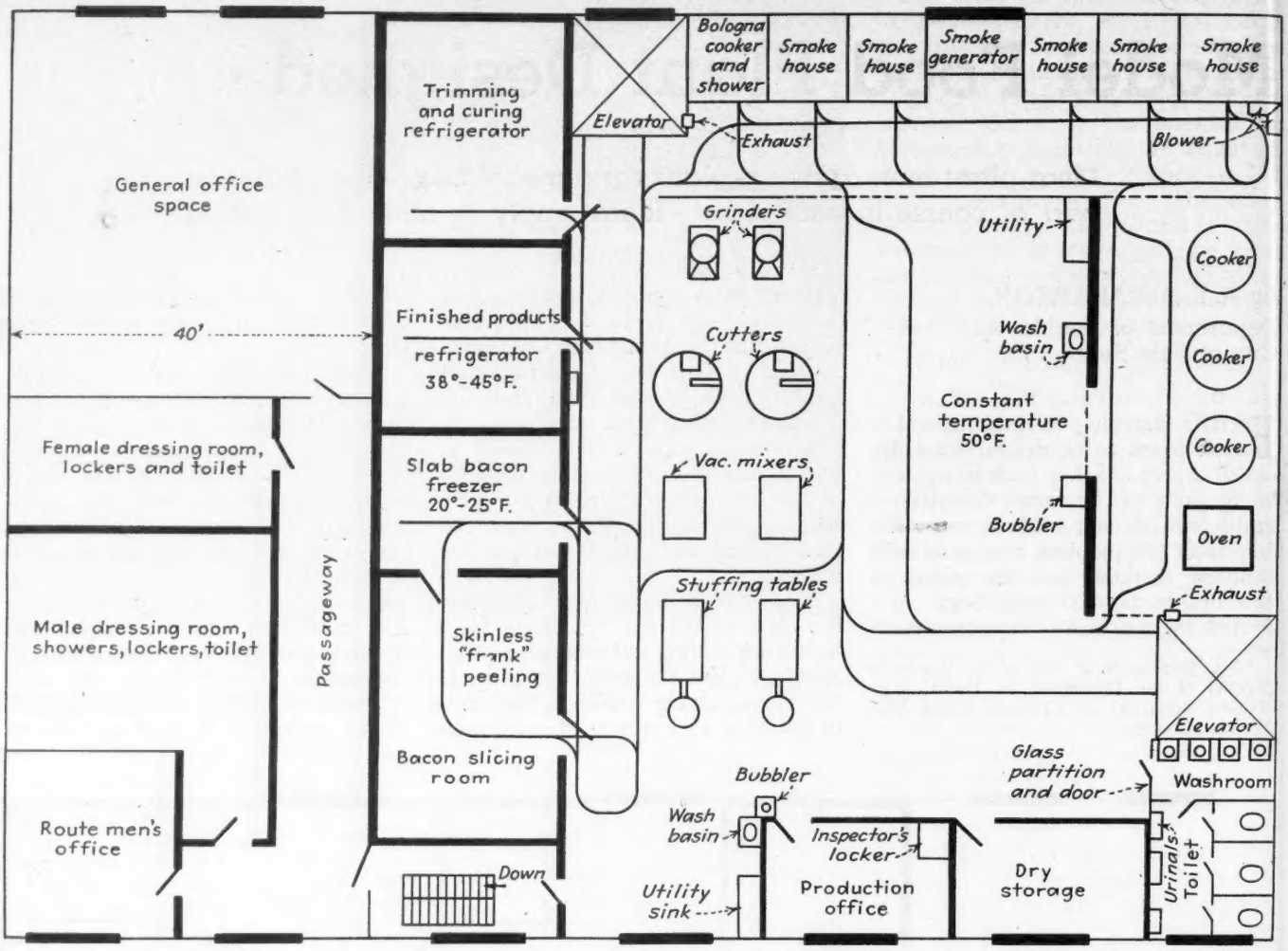
In making the plans for the model hog cutting and processing plant, present-day problems in regard to priorities and restrictions on materials were not considered. The plant cost was to be moderate, but efficiency through layout and installation of suitable equipment of sanitary design were uppermost considerations.

The most desirable site for this plant, in the estimation of most members of

* Mr. Abrahamson is chief of the Wholesale Division of the Department of Health, City of New York, and an instructor in the War Training Course.



First-floor plan of model hog cutting plant (Window in elevator shaft should be in lard room).



Second-floor plan of hog cutting plant designed as a model food factory.

the class, was one having a railroad siding. But in New York City lack of such a convenience would not make a site unprofitable. So it was decided to construct a plant in New York having truck transportation only. Loading and unloading, therefore, was to be at tailboard height to a loading platform set in from the building line so that the upper story of the building served as a protective shed.

Decide on Multi-story Plant

Much discussion centered about the construction of the building. A one-story plant, with all operations at one level, and a multi-storied plant were considered from many aspects. Experiences of most of the men favored the construction of a two-story building and cellar, with the wet operations in the cellar. Most of the men felt that the novelty of glass-brick wall construction was unsuited to pork for technological reasons, primarily because of the effect on the color of the pork and the difficulty in maintaining constantly cool working conditions cheaply.

The class determined to operate its own fleet of trucks rather than hire transportation. Therefore, a suitable garage was needed.

Thus, each problem of construction and operation was discussed and the experiences, good and bad, of the class members gave rise to a plant design which incorporates the ideas of men who work with disadvantages in their plant and who probably never before were asked for suggestions in respect to higher efficiency, better sanitation or other worthwhile improvements. Or if they were asked, they failed to see their ideas realized. Their enthusiasm, therefore, was great. Some day when life becomes normal, the compilation of their ideas may serve others.

There were three lay inspectors of the U. S. Livestock and Meat Inspection Branch of the War Food Administration in the class. It may be assumed, therefore, that the plant will be in fair compliance with the Federal meat inspection requirements.

The plant which was planned is 100x 100 ft. and has a 40x100-ft. two-story garage building adjoining. The plant has a capacity of 700 hogs daily. The hogs are split in the cooler by portable saw or cleaver before going to the cutting room.

Cutting Department

The cutting operation is done in a room on the street level. The operation consists of the disassembly of the hog on a long conveyor table of the latest sanitary type, preferably an endless stainless steel belt with four smaller take-off conveyor tables at points in the operation to permit suitable time for cutting. Each table terminates at a chute. Hams, bellies, shoulders, butts, back fat and trimmings drop through removable stainless steel chutes to tables, tierces or trucks in the cellar below.

The floor of the cutting room is constructed of concrete and packing-house brick. It is pitched to conveniently located floor drains. The walls are of glazed tile to the ceiling. The room is maintained constantly at 50 deg. F. by circulating refrigerated air. Fluorescent lamps supply light to all working points at an intensity of 20 foot-candles.

A novel toilet and washroom arrangement was designed for each floor. The

toilet consists of three bowls, each privately enclosed by dwarf partitions. A narrow 3-ft. aisle is permitted between the toilet and three urinals on the opposite side of the room. It was pointed out that this arrangement is compact and would not permit loitering. A washroom consisting of four basins with running hot and cold water, individual towels and soap, is provided immediately adjoining the toilet room. The washroom has a clear-glass paneled door. The walls to the outer room are constructed of glass-paneled partitions so that the entire washroom is visible from the outer room. It was argued that this arrangement would reduce the tendency of loitering and would assure that all those who enter the toilet must wash their hands before they leave the washroom or incur the disfavor of their fellow workers.

At two convenient places as shown, utility sinks are installed with running hot and cold water. Hand basins are also provided near each utility sink to encourage hand washing.

The cutting room is big enough to provide adequate space for packing fresh hams and loins, and it accommodates a table for boning out beef for trimmings.

Two elevators are provided to prevent a bottleneck in case of a breakdown. They are located so that they may be most efficiently employed.

On the first floor are also a delivery clerk's office having a toilet that is convenient for buyers, a glass-enclosed refrigerated salesroom and three roomy hog coolers. Completing the layout is a lard-rendering room measuring 16x13 ft., this having a capacity of about 1,500 to 2,000 lb. daily. There are five windows on this floor, giving about 3,500 sq.ft. of exposure to daylight. This is more than 25 percent of the working floor area.

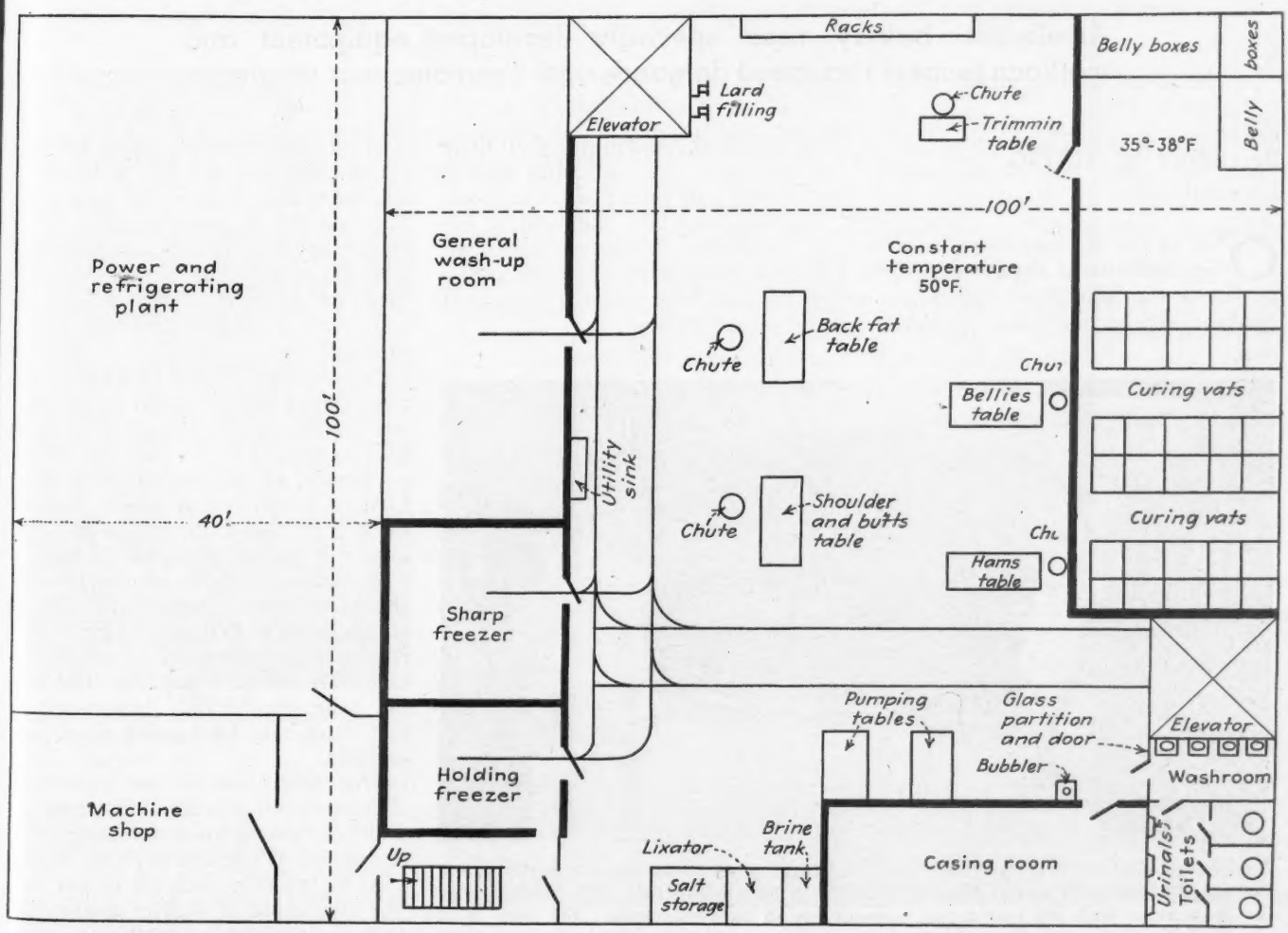
Second Floor

The second floor is also constructed of concrete and packing-house brick, is well drained, and has walls of glazed tile for the full height. Like the cutting department, this floor is lighted by fluorescent lamps to an intensity of 20 foot-candles at all working points, and glass-brick sections in the ceiling supplement the window space for daylight. The floor accommodates a bacon slicing and packing and a skinless frankfurter peeling and packing room of ample size, as well as a slab-bacon sharp freezer, a finished-product refrigerator and a trimming and curing refrigerator.

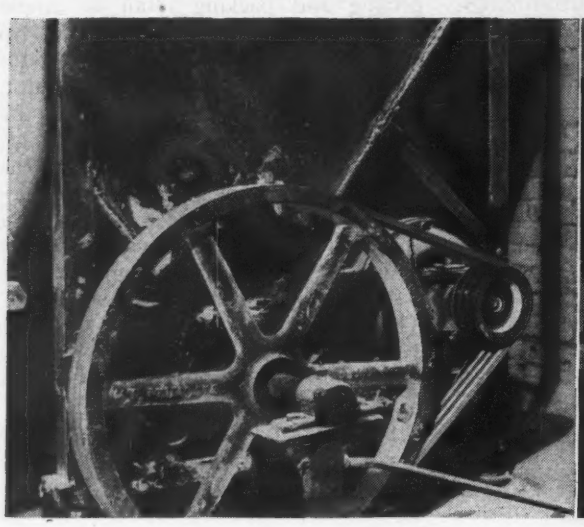
There are five smokehouses which are electrically controlled by interchangeable cams which are cut to control the smoke, time, temperature and humidity factors. Smoke is made in a generator and may be raised to any temperature desired by a steam coil or humidified by a steam injector in the smokehouse. This operation is electrically timed to assure uniformity. A sanitary combination spray-type cooker and shower is provided.

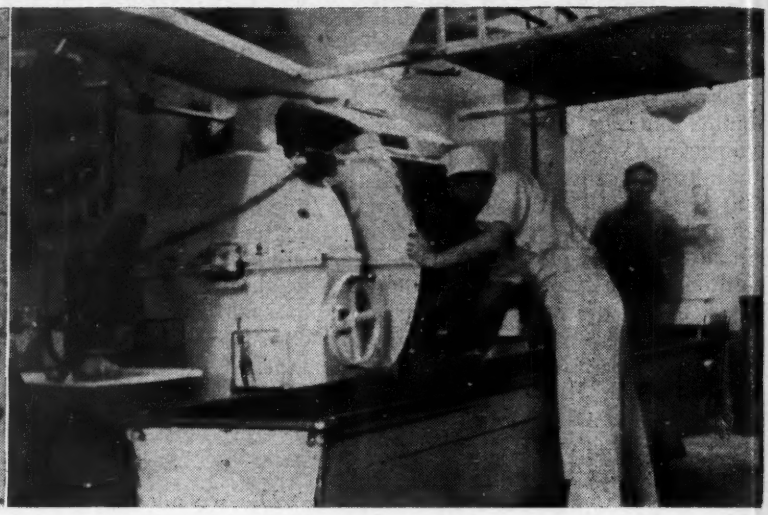
Smoking and cooking operations are separated from the central part of the floor by a wall having arched openings for the overhead conveyor rails. At right angles to this smokehouse section is a similarly enclosed cooking department. These spaces are ventilated with outside air by a blower located at the junction of the outer walls of both departments. The heat is exhausted to the outdoors via ducts in the elevator shaft by two exhaust fans located at the end of each section. The combined exhaust is less

(Turn to page 120)



Cellar plan of the model hog cutting plant designed by men in meat industry as part of course on food handling and sanitation





LEFT: Drive on a blending machine designed and built by the company's engineer. In the bottom of a two-part bin is an agitator forcing the flour down through rows of holes in two plates which slide over one another, and thence into a screw conveyor operated by this drive. The degree of coincidence of the two sets of holes is adjustable and determines the rate of flow. With one type of flour in one bin and another type in the other, any blend may be achieved or either used separately. The mixture flows by chute to the batcher below.
RIGHT: One of two mixers with a capacity of 900 lb. of dough to a batch. Above the mixers is a traveling weigher that is fed from the blender and charges either mixer.

Food Plant With New Ideas

All-electric bakery uses specially developed equipment and methods to meet increased demands and overcome war shortages

By HENRY W. YOUNG
Portland, Ore.

ONE of the few completely electrified bakeries on the Pacific Coast is that of the Silver Loaf Bakery Co., Spokane, Wash., of which L. L. Francis is the president. And in this plant there are also several new and better ways of performing unit food plant operations.

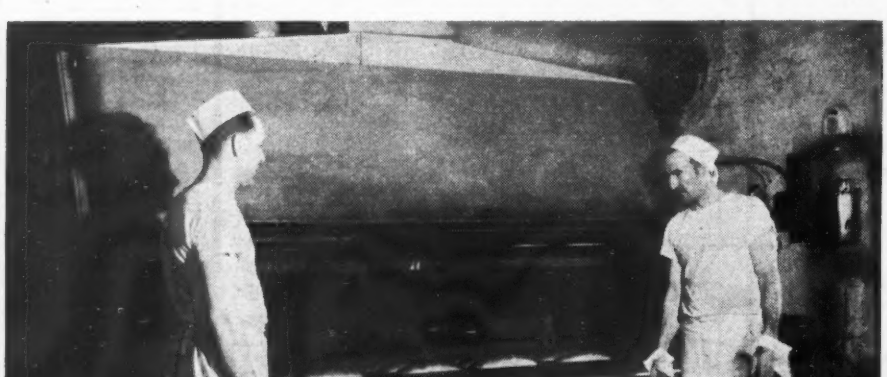
In remodeling both the building and the installation in recent years, Mr. Francis decided upon all-electric operation for these basic reasons, as expressed in his own words:

"First, it has been my experience that a better loaf of bread can be baked in an electric oven than in any other type. The heat is more uniform, there being little if any flash heat as in the case of fuel-type ovens. This results in a loaf baked evenly on all sides, and I can get a firmer loaf, evenly browned on all surfaces.

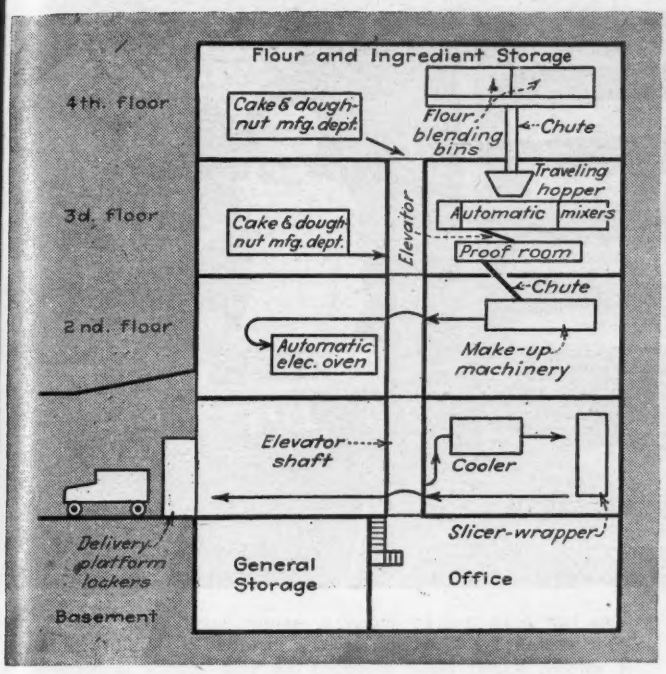
"The all-electric idea also has a definite popular appeal. From an advertising standpoint, our promotion is largely built up around it.

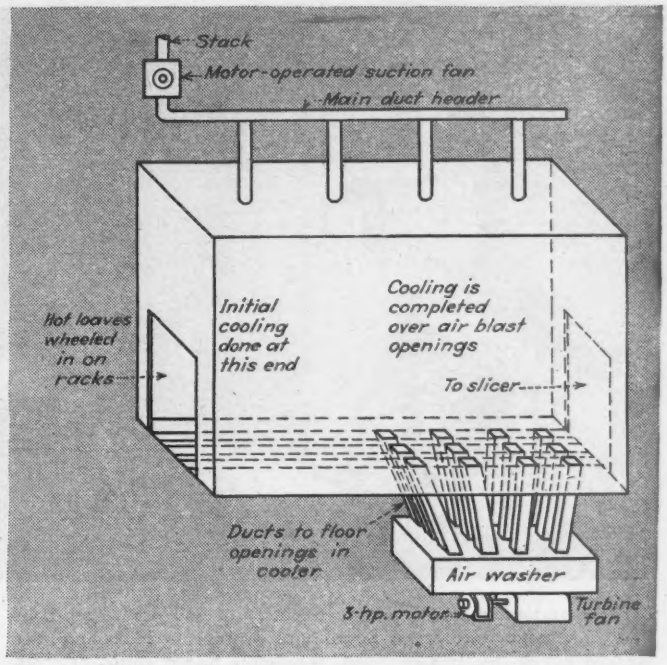
"Finally, we are situated not far from Grand Coulee, largest power development in the world, the output of which is now a part of the great Northwest power pool. I obtain service through the Washington Water Power Co., a strong factor in that pool. I think that it is only common sense to reason that electricity will get cheaper as time goes on, rather than dearer. As a matter of fact, rates have been going down consistently.

"As nearly as I can ascertain, it is now costing us about 20 cents per 1,000 one-pound loaves for energy used in baking. While this is about 20 percent higher than with oil or gas, and the investment is slightly greater, the facts that we have less trouble and make a better, more uniform product over-



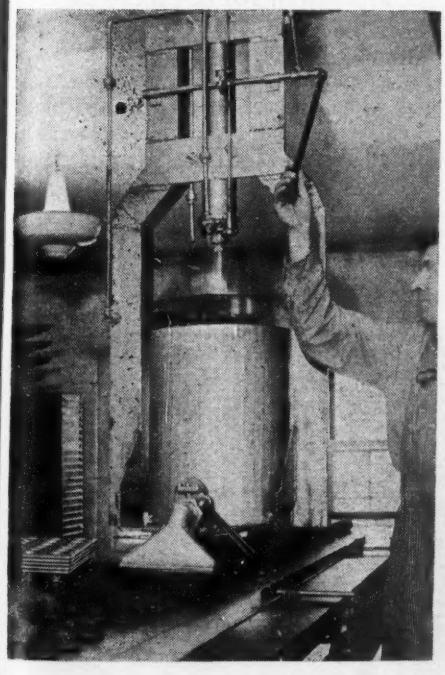
Ranier type electric bread oven with thirty-two 84x21-in. trays. It has a capacity 48,000 one-pound loaves in 24 hours. Heating units are of the enclosed helix type, controlled by six thermostats, each top and bottom element having its own control. The oven is of the single-loop type, the inside conveyor being chain operated. Observation windows are provided, with electric lights within to permit observing progress of the baking.





LEFT: This is an approximate flow-sheet of the operation of the Silver Loaf bakery, showing where the major equipment is spotted. Every machine is electrically operated. Transfer from one to another is by elevator, chute, conveyor or manually operated trucks carrying the racks.

RIGHT: This is a new type of bread cooler devised and built by the company. The loaf racks are wheeled into a cooling room on one side and out on the other. A motor-driven air washer and cooler is located on the floor below. Cold air is blown up through the ducts to the openings in the floor at one end of the room, and drawn out through ducts in the ceiling to a stack. Preliminary cooling is accomplished by holding the trucks at the entering end in comparatively still air. Final cooling comes when they are moved forward immediately over the duct openings.



Here is an icing machine designed by the chief engineer, William H. Green. The cylinder is filled with icing and a plunger, operated by compressed air, forces the icing out through the nozzle onto the cakes, which travel on a conveyor belt beneath. Controls permit adjusting the flow of the icing to the exact speed of the belt, otherwise icing would either break or wrinkle. The nozzle is a standard vacuum-cleaner unit. This is a typical example of the use of ingenuity to solve production problems.

balance the slightly higher cost many times over. As power rates continue to go down, which is in prospect, we will be in a still more favorable position."

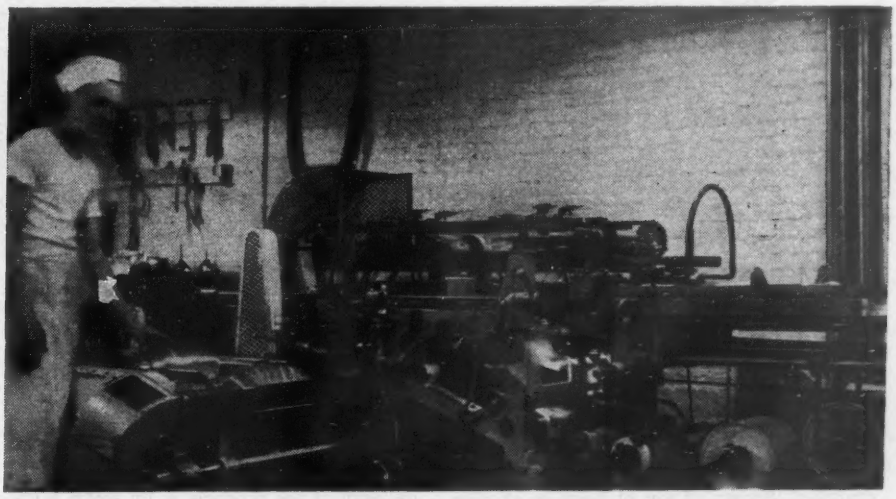
The connected motor load in this bakery is approximately 125 hp., the largest units being two 20-hp. motors on the two mixing machines. The total motor and heating load is 494 kva. and the maximum demand 300 kw., with an overall power factor of 90 percent. A breakdown of the heating load is given in the table.

Electrical Heating Load

1 bread oven	250 kw.
1 cake oven, revolving-deck type	40 kw.
1 cake oven, stationary-deck type	24 kw.
1 doughnut machine	30 kw.
Miscellaneous heating load	10 kw.

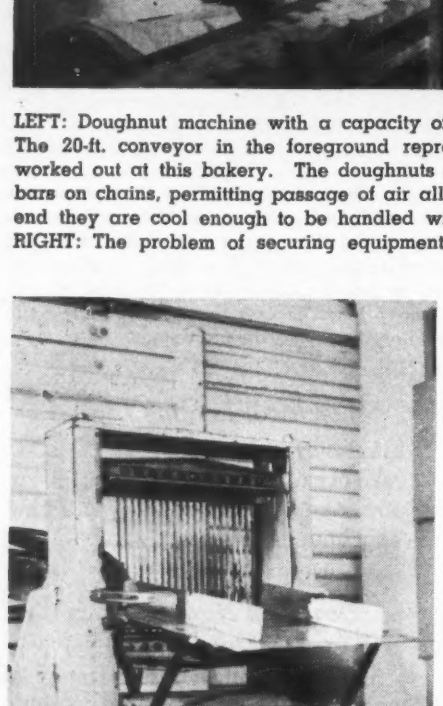
Develops New Methods

The use of electricity for baking is by no means the only unusual feature of the Silver Loaf bakery. To perform various unit operations more efficiently



General view of the bread slicing and wrapping department. The long machine by the far wall is the automatic slicer-wrapper.

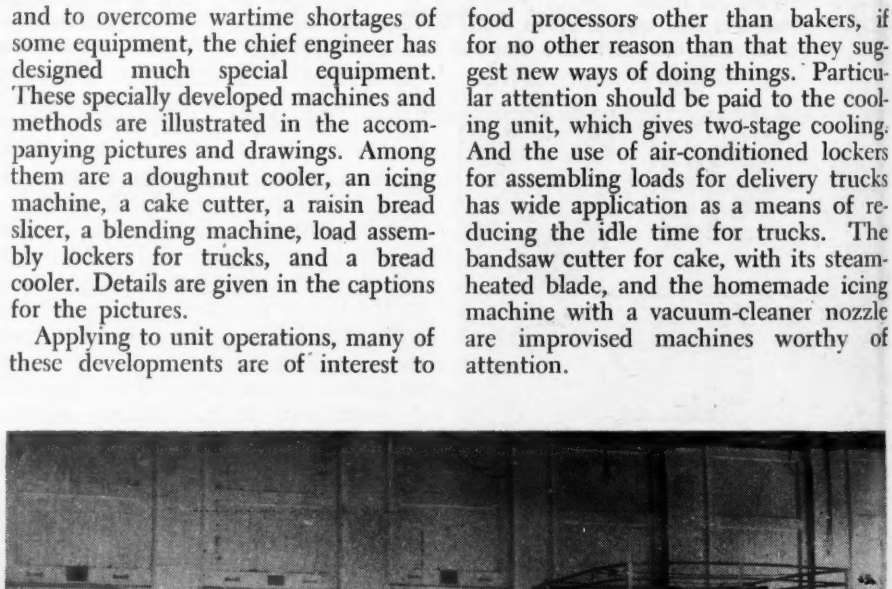
LEFT: Doughnut machine with a capacity of 250 dozen per hour. The 20-ft. conveyor in the foreground represents a cooling idea worked out at this bakery. The doughnuts ride a series of crossbars on chains, permitting passage of air all around them. At the end they are cool enough to be handled without "crimping."
RIGHT: The problem of securing equipment under present conditions has been met by many ingenious substitutes. In this case they needed a cake cutter, so they installed a standard bandsaw. A smooth edged band replaced the saw and it is arranged to run through a steam box below to moisten the blade and prevent it from sticking. A belt conveyor carries the cakes away to the wrappers.



The ordinary slicing machine will not work well on raisin bread, having a tendency to clog. So a special "gang saw" was built, another wartime contrivance. It works so well that it will probably survive after the duration. Shown at top of page is another interesting cutting machine application—a bandsaw used to cut cake.

and to overcome wartime shortages of some equipment, the chief engineer has designed much special equipment. These specially developed machines and methods are illustrated in the accompanying pictures and drawings. Among them are a doughnut cooler, an icing machine, a cake cutter, a raisin bread slicer, a blending machine, load assembly lockers for trucks, and a bread cooler. Details are given in the captions for the pictures.

Applying to unit operations, many of these developments are of interest to food processors other than bakers, if for no other reason than that they suggest new ways of doing things. Particular attention should be paid to the cooling unit, which gives two-stage cooling. And the use of air-conditioned lockers for assembling loads for delivery trucks has wide application as a means of reducing the idle time for trucks. The bandsaw cutter for cake, with its steam-heated blade, and the homemade icing machine with a vacuum-cleaner nozzle are improvised machines worthy of attention.



Delivery of the products is by motor truck over a territory some 165 miles in radius. This makes a long day's work for some of the trucks. To save time, the load for each truck is assembled in an air-conditioned locker the night before, ready to go out the next morning.

Production, Processing And Uses of Chicory

By LLOYD STOUFFER, Detroit, Mich.

While coffee shortage has recently attracted attention to chicory, this Michigan grown specialty is also finding use by manufacturers of sauces, chocolate, baked foods, and other products.

CHICORY production is one of America's least-known food industries. It flashes briefly to attention in wartime, when the flavor-stretching qualities for which chicory is best known assume special value; and then usually fades again into the background save for the few sections of the country where the coffee-chicory blend is traditional.

In this war, however, chicory has attracted interest as a seasoning and extender for a wide variety of foods other than coffee. Its producers are hopeful that, with popular prejudice and misunderstanding rapidly being dispelled in the light of recent medical and scientific reports showing just what chicory is and does, it may gain a permanent grip on public fancy. In addition to meeting the recent record demand as a coffee extender, chicory is now being employed by manufacturers of chocolate, soybean sauces and Worcestershire sauce to give body, color and some additional flavor. For this purpose, a sirup concentrate obtained by boiling the ground chicory root usually is employed.

One of the two large processors of chicory also is taking advantage of wartime interest in the root to press for its acceptance by housewives as a seasoning deserving a permanent place on the kitchen condiment shelf. This campaign is based on the long-known but little-circulated fact that the very qualities in roasted chicory which add character and "body" to coffee also create a more rounded, almost meat-like flavor in certain other foods. Chefs of European background have long used chicory as a seasoning in thick soups, sauces and gravies, where richness and deeper color are desirable. It has also been discovered that it blends well with meat and vegetables and seems to sharpen the flavor qualities, and that it improves cakes and cookies made with chocolate, molasses or ginger.

A booklet of kitchen-tested recipes now being distributed to housewives through the food stores calls for the use of chicory in powdered or tablet form in nearly 50 different dishes, ranging from soup to ice cream. Chicory is hygroscopic; it picks up and retains moisture from the air, and when used in cakes and cookies tends to keep them moist for some time. It was at one time widely used in tobacco as a moisture retainer.

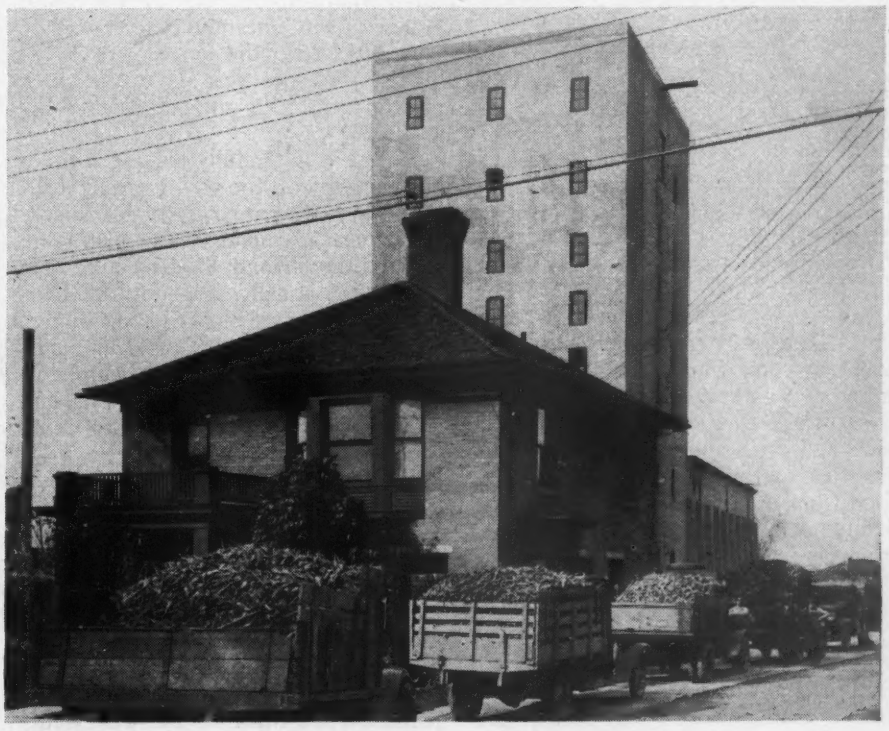
What Chicory Is

Virtually the entire commercial chicory industry in this country—the growing, drying and roasting—is compressed into one corner of Michigan, the Saginaw Valley and Thumb areas, centering around Bay City and Port Huron. The two principal chicory companies—The E. B. Muller Co. and Heinr. Franck Sons, Inc.—both maintain large dry kilns at Bay City as well as smaller ones throughout the growing area, and have roasting and packaging plants at Port Huron.

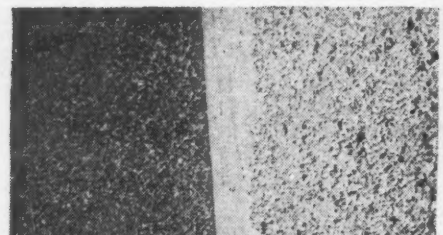
The Franck company has a branch plant at Flushing, L. I., and a New Orleans company operates a kiln at Linwood, Mich.

Chicory is the root of *Cichorium intybus*, a plant related to the dandelion and closely resembling the parsnip and the sugar beet, being slightly smaller than the sugar beet. Its culture and harvesting are almost identical to that of the sugar beet, with which it competes for field space in the Michigan area. On many farms sugar beets and chicory are planted side by side.

In the past, as high as 10,000 acres of chicory has been placed under cultivation in the Michigan area, but the total planting will probably not run half that this year. During favorable weather conditions, careful cultivation may yield 12 tons of roots per acre, but the average yield is closer to 5 tons per acre. It



Chicory roots are delivered to the drying plant where, after they are washed and sliced, about 78 percent of the moisture content is removed by kiln drying.



After drying, chicory root is stored until required at the processing plants for roasting. It is said to improve during storage.

The green chicory roots, shown in the men's hands, are cut or sliced into pieces about the size of an egg before they are dried.

is unlikely that more than 40,000,000 lb. of raw chicory root will be produced this year.

The chicory root is essentially a concentrated combination of three sugars (pentose, levulose and dextrose) and taraxarcine (the bitter principle of the dandelion). The chemical composition of ground or granulated chicory is given in Table I.

TABLE I—Composition of Ground or Granulated Chicory

	Percent
Moisture	3.5
Ash	4.7
Water-soluble ash	2.9
Acid-soluble ash	0.4
Fat (petroleum ether extract)	3.6
Protein (N X 6.25)	7.3
Crude fiber	7.9
Reducing sugars as invert	8.6
Sucrose (copper reduction method)	0.4
Total carbohydrates other than crude fiber (by difference)	73.0
Water extract	69.0

Calories: 2.5 per gram; 71 per ounce.

According to H. C. Rather, Michigan State College extension specialist, the time may come when chicory will be of importance as a source of levulose, just as sucrose is now extracted from sugar beets and cane, and dextrose from various fruits and plants. As dextrose is derived from the conversion of starch, the notable commercial product being corn sugar, so levulose comes from inulin, a starch-like substance found chiefly in the tubers of the Jerusalem artichoke and the roots of chicory.

An immediate byproduct of chicory culture is, however, perhaps better known than chicory itself. Under the name of "French endive," the forced second growth of the roots (of the Witloof variety) is widely used as a salad, while the curly tops, or "curly chicory," are regularly sold in many markets and used with, or to replace, lettuce.

Growing of chicory in Michigan is by contract with independent farmers. Contracts entered into during the winter, between processor and farmer, specify the acreage to be planted and the price per ton to be paid to the grower on completion of delivery of his crop. While chicory does not yield as heavily as sugar beets, the price per ton is higher. For the year 1943 the price per ton is $16, as compared with $13 in 1942.

The seed is carefully planted in mid-May, often with the use of special drills which may be rented from the chicory companies. As soon as the plants are rowed through and have received one cultivation, usually at about the four-leaf stage, they are blocked and thinned, leaving a stand of 125 to 150 plants per 100 ft. Chicory is almost completely resistant to disease and insect pests, and is more resistant to drought and excessive moisture than the sugar beet.

Processing Chicory

Chicory roots get their best development during the cool weather at the end of the season. At harvest time in September, the roots are lifted from the ground with a beet lifter, pulled and piled by hand, the heavy green leaves topped off and the roots delivered immediately by truck to the nearest dry kiln.

There the root is washed and sliced into pieces about the size of an egg and elevated to the top of the kiln or dryer. Floor by floor, the chopped root is brought down through the dryer over a coke fire which drives off about 78 percent of the water and greatly reduces the bulk. The dryer, with coke furnaces at the bottom, has exhaust fans that draw the hot air through the chicory, which is loaded on perforated metal dumping floors.

At the end of about eight hours the drying cycle is complete. The dried root is then stored in warehouses until it is required for shipment to the processing plants at Port Huron. In its dried condition, the chicory retains its qualities indefinitely.

At the manufacturing plant, the dry root is again screened and is fed to specially designed drum roasters heated by hot air with positive heat control (Calo-ritherm process), which assures a remarkably even roast. Indirect firing prevents burning and produces a high percentage of invert sugar. Further shrinkage takes place in the roasting.

The freshly roasted chicory is immediately ground to various degrees of fineness, depending upon the demands of the trade. Special mills are required to produce granulations ranging from the size of a bean to the finest pulverization. As supplied to the retail trade for home use, the chicory is offered in granulated form, in powder, or powdered and compressed into tablets; all forms are attractively boxed for retail sale.

There are, in fact, some 30 different forms of grinds and packaging, to suit all tastes and uses. The "stick," or roll, chicory, was once an old favorite for home use. The tablet form is packed in a carton containing 40 tablets scored so that they may be readily broken should less chicory be desired. A single tablet is usually sufficient for a pot of coffee containing five or six cups.

The powdered form is packed not only in a 6¾-oz. square package for home use, but is supplied in bulk to the baking trade, where it is frequently used for flavoring dark rye or pumpernickel bread.

The bulk of the roasted chicory, however, is shipped to coffee roasters for blending purposes, and for this purpose it is ground to the same granulation as the coffee, which it resembles in color and appearance through close control of the roasting.

After grinding, the chicory is passed to separating, tumbling and blending mills. These are specially designed types of machinery which produce a final pure, high-grade, granulated chicory. The finished product is discharged into hoppers from which the chicory is drawn, bagged and shipped to coffee roasters. The hoppers are kept filled by automatic end-

less conveyors operating throughout the plant. For commercial use, the chicory is usually packed in paper-lined, moisture-resistant jute bags of 140 to 145 lb. net.

For the retail trade, there are automatic machines which fill and seal cartons of powdered or granulated chicory. In one plant, these machines produce 25,000 of the 6¾-oz. packages each eight hours. Other machines compress and pack the chicory in roll or tablet form.

Roasters blend chicory with their coffee according to their own ideas and the tastes of the consumers they are supplying, or the area of the country to which they are shipping. The taste for chicory varies sharply according to region.

Probably the greater portion of all chicory produced in normal times is consumed in the South and particularly in the New Orleans area, where chicory has been a requisite of all coffee blends since before the Civil War. For the New Orleans trade, both coffee and chicory are heavily roasted, and the chicory content of the blend is as high as 35 to 40 per cent. Other regional blends range from a low of 6 percent in the New York area through the average of 15 percent in the North and East.

Flavor of Chicory

It is difficult to define the taste of chicory or to tell just what it does for coffee. A brew of 100 percent chicory would be so bitter as to be unpalatable, yet the root actually has a bitter-sweet quality due to the combination of natural sugars, caramelized by the roasting process, with the bitter qualities of the vegetable. The flavor of a thick solution made from chicory powder and water is somewhat akin to a sirup made from unsweetened cooking chocolate.

It has been definitely proved by laboratory tests and by long usage that chicory gives deeper body and color to the coffee brew, and that it causes flavor to be retained considerably longer when the brew stands for a period of time. Perhaps it is principally for the latter reason that various chicory blends with coffee have for years been used by the large hotels and restaurants, many of them famed for their coffee.

The chicory manufacturers are now engaged in a campaign of education and enlightenment which it is hoped will dispel once and for all the prejudice, amounting almost to a superstition, against chicory. This prejudice seems to be based on the idea (1) that chicory is a harmful drug, and (2) that it is a cheap substitute, or filler, for coffee, used only by unscrupulous roasters.

The idea that there is something wrong with chicory is fostered by unenlightened laws in some states (including Michigan) which class it with all cereal fillers and require that restaurants using it must so advise their patrons by prominently displayed signs. It is true that low-cost coffee compounds frequently contain as much as 50 percent cereal together with chicory and coffee; unfortunately, chicory has borne the blame for the resulting lack of true coffee flavor. The truth of the matter is that chicory costs as much as, and sometimes more than, the popular grades of coffee, and thus the roaster obviously has no penny-pinching motive in using it.

As to the idea that chicory has any medically harmful constituents, unquestioned medical research and testimony now show this to be absolutely untrue and that, on the contrary, it is physically beneficial.

Among prominent physicians who have expressed favorable opinions of chicory are Dr. Charles W. Green, of New York; Prof. Dr. F. Hueppe, of the University of Prague; Prof. Dr. Kianko, of Jena; Prof. Dr. Beckurts, of Braunschweig, and Prof. Dr. Bickel, of Berlin. Their findings are summed up by Dr. Schmeideberg, Strasburg i. Els:

"After thorough examination it is certain that coffee and chicory have real food value . . . that it is not injurious to health; in fact, it has a directly beneficial effect on the organs of digestion and is capable of suppressing the processes of decomposition in the stomach and intestinal canal and preventing their occurrence."

Chicory is roasted by means of a current of heated air under positive heat control, assuring an even roast to specified color.

After roasting, chicory is ground, separated and blended, then discharged into hoppers from which it is filled into bags.

The new quick freezing plant of Dixie Frosted Foods Co., located in Georgiana, Ala.

Dual-Process Quick Freezing Plant Built in South

By GEO. H. WATSON, Birmingham, Ala.

In a new plant with a 50,000-lb. daily capacity, Dixie Frosted Foods freezes part of its output in loose form in an immersion unit and part in containers up to 30-lb. size in an air-blast freezer. Plant will operate almost year around

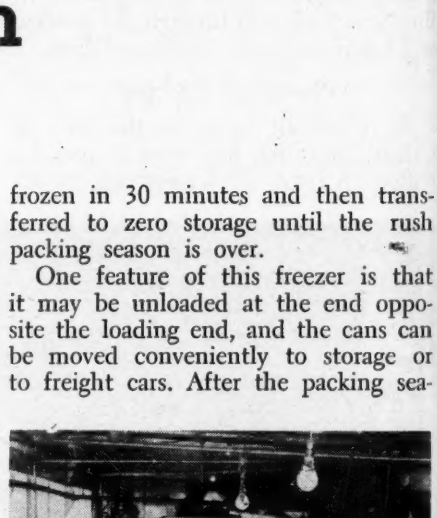
TWO entirely different types of freezing methods and two separate production lines are utilized in the new, modern, $75,000 quick freezing plant of Dixie Frosted Foods Co. at Georgiana, Ala. In this plant, which has a capacity of 50,000 lb. of frozen foods a day, there are a TVA immersion freezer and a Burge Ice Machine Co. air-blast freezer. The immersion unit produces individually frozen fruits, berries and vegetables which are packaged after freezing, while the Burge machine freezes the products in the container, being used principally for leafy vegetables and for fruits packed in sugar or sirup. This arrangement makes for flexibility and efficiency in the plant operations.

In the immersion freezer, the products are very quickly frozen by immersion in a low-temperature glycerine solution. Strawberries freeze in 4 to 6 minutes and vegetables in from 30 seconds to 2 minutes. After freezing, the products are centrifuged to remove the excess glycerine solution adhering to them, this freezing medium being clarified for re-use.

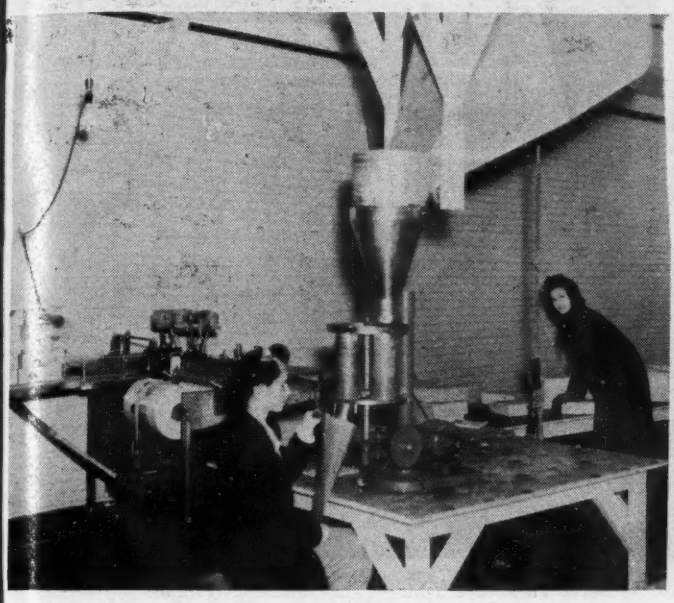
The immersion freezer has an hourly capacity of 2,000 lb. of strawberries, 4,000 lb. of English peas or 3,000 lb. of lima beans, the capacity varying with the product.

The Burge freezer, located in the chill room, has four compartments, each large enough to hold 380 cans of 30-lb. size. The daily production capacity of this unit is 30,000 lb. Freezing is by air blast, the refrigerated air being circulated from top to bottom across the cans. For quick freezing, a temperature of —40 deg. F. is maintained, cans of fruits or vegetables being completely frozen in 4½ to 5 hours. During the peak of the season, products may be prefrozen in 30 minutes and then transferred to zero storage until the rush packing season is over.

One feature of this freezer is that it may be unloaded at the end opposite the loading end, and the cans can be moved conveniently to storage or to freight cars. After the packing sea-



Beans on the picking "table". Here the defective beans are thrown out.



Beans individually frozen in immersion freezer are filled into waxed paper bags by Whiz packer. Bags are inserted into cartons, which are wrapped in waxed paper and heat sealed.

Miller wrapping and sealing machine wraps cartons of frozen beans in waxed paper and heat seals the wrapper. The cartons are then packed ten to a case.

son ends, the doors of the freezer may be left open if desired and the compartments used to supplement storage facilities.

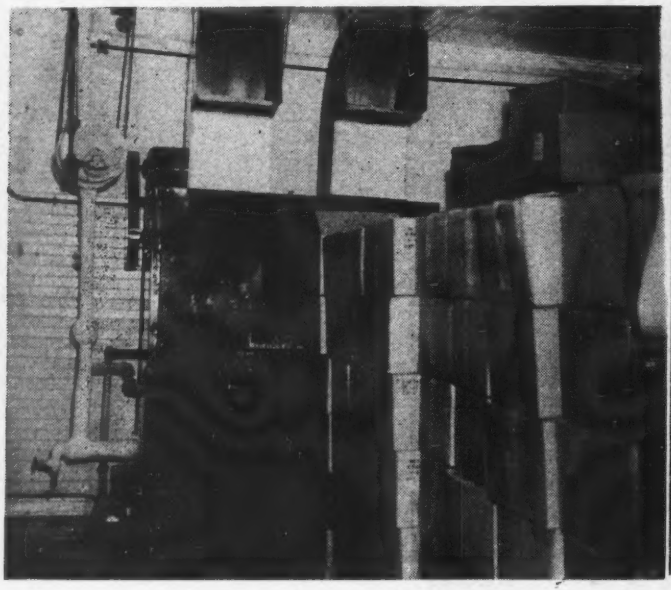
The processes through which the fruits and vegetables are put preparatory to freezing vary, of course, with the product and with the method of freezing. In freezing beans, the operations are as follows:

1. The beans are run through a revolving, perforated Buck snipper.
2. Ends not snipped by the machine are removed by hand at a picking table.
3. The beans are blanched for 2 minutes at 200 deg. F. in a continuous Berlin-Chapman steam blancher.
4. Washing and cooling are done in a continuous-flow flume, in fresh water.
5. Water is drained from the beans in a separator.
6. Inferior beans are sorted out on a picking table.
7. The beans are packaged by hand.
8. The packages are placed on trays in the spot freezer.
9. The packages are wrapped and sealed in an automatic machine and then cased and placed in zero storage.

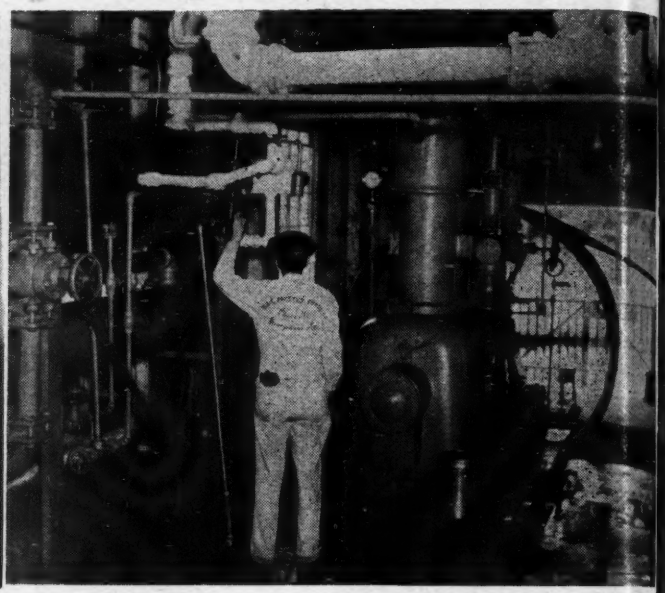
Where the immersion freezer is used, the first six operations are the same as those just listed. Then, from the picking table, an elevator carries the beans to the immersion unit and discharges them into the freezing solution, to be frozen solid in one minute. On leaving the freezer the beans move by elevator into the 35-deg. F. packing room where the centrifugals are located. Operating at 900 r.p.m., these machines remove the excess liquid from the product and then discharge their load automatically.

Girls weigh the beans, pack them into 4-lb. waxed paper bags, and put the bags into waxed paperboard containers prior to freezing. Doors of Burge air-blast freezer are shown in background.

David W. King removes some of the cartons of frozen beans from the Burge freezer.



View in zero storage room, showing 15-ton floor-type blower in background.



General view in machine room, showing refrigerating equipment. Booster compressor is shown at bottom of page.

Packaging of the beans frozen individually in the immersion freezer is done by a Whiz packer, which measures out the desired quantity into waxed paper bags. These bags are placed into heavily waxed paperboard cartons which are then wrapped in lithographed waxed paper and heat sealed. Beans are packed in 4-lb. packages, ten of these to the case. Lima beans, English peas and crowder peas are put up in 5-lb. packages.

In the past season, Dixie Frosted Foods froze a large quantity of corn on the cob, putting eight ears in a package, 12 packages to the case. It is believed to be the first company to ship a solid carload of corn from the South to the East. In processing, the corn was passed through the operations of husking, washing, trimming, blanching, cooling, packaging, freezing and casing.

(Turn to page 111)

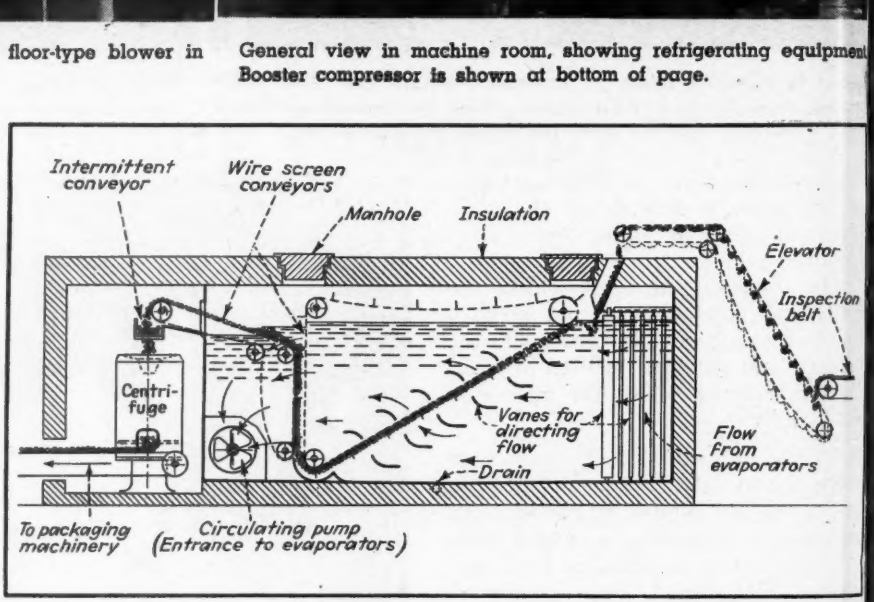
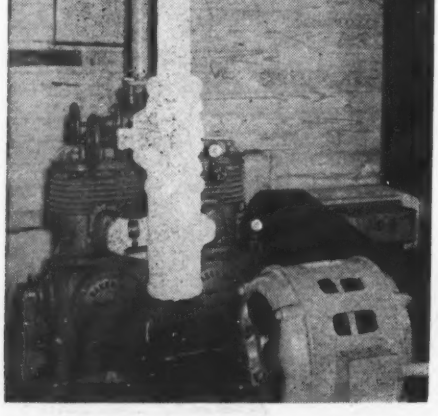
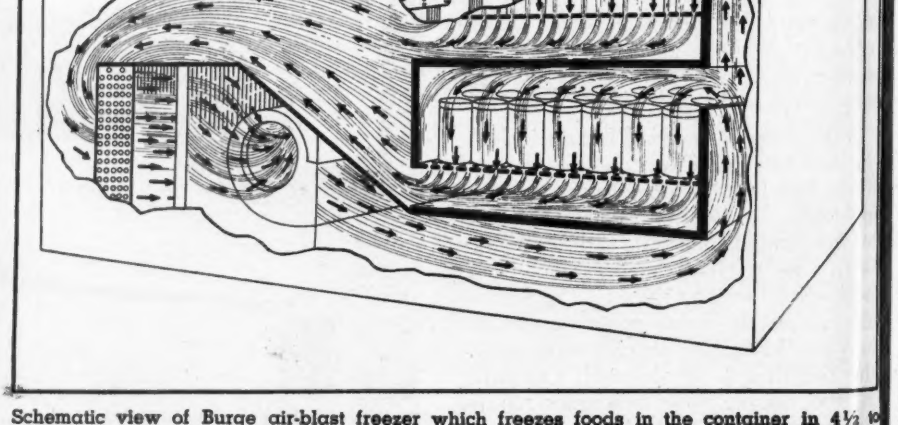


Diagram of immersion freezer which quick freezes fruits in 4 to 6 minutes, vegetables in 30 seconds to 2 minutes.



Close-up of booster compressor.



Schematic view of Burge air-blast freezer which freezes foods in the container in 4½ to 5 hours.

How To Cook Food For Quick Freezing*

Flavor and vitamin retention in pork and beans are improved by this processing method. Formula modifications yield a product with good consistency during thawing and heating

METHODS to be used in preparing baked beans with tomato sauce, as worked out by the Western Regional Research Laboratory, offer suggestions also for the preparation of other quick frozen "ready made" dishes.

The first point of importance is that the various parts of the mixture may, and in this case should, be cooked separately and mixed just before the packaging and freezing operations. When all of the ingredients were cooked together, the beans mashed badly and were difficult to package, the tomato was overcooked, and it was impossible to place uniform quantities of sauce and beans in each package.

Pectin is added to prevent curdling of the sauce when it is thawed. The curdled appearance of sauce made without pectin disappeared when the pork and beans were heated and stirred, but an unattractive product at any stage is considered undesirable, and therefore the inclusion of pectin is recommended. Cornstarch is added as a thickening agent. In the canning procedure starch from broken beans probably thickens the sauce, but the thickening agent is needed for the frozen product.

The beans must not be overcooked. In the recommended procedure, small white beans are blanched for 4 minutes at 170 deg. F., soaked in soft cold water for 16 hours (the water being changed three times), drained and cooked in wire baskets 50 minutes at 15-lb. steam pressure. Longer cooking yields a darker brown bean, but reduces the thiamine content.

When beans were cooked for 50 minutes at 15-lb. pressure, the finished product contained 106 micrograms of thiamine per 100 grams. By increasing the cooking time to 75 minutes, to give a dark brown bean, the thiamine in the finished product was reduced to about one-fourth as much, 26 micrograms per 100 grams. Cooking in flowing steam for 3½ hours made the beans about as brown as those cooked 50 minutes at 15-lb. pressure, and they had approximately the same thiamine content, 104 micrograms per 100 grams. For comparison, a sample of commercially canned pork and beans of the tomato sauce type was analyzed and found to contain 58 micrograms of thiamine per 100 grams.

Finished pork and beans prepared by the recommended method contained, in addition to the 106 micrograms of thiamine, 3.94 milligrams of ascorbic acid, 20 micrograms of riboflavin, and 2.3 milligrams of iron per 100 grams. Calculations indicated approximately 157 calories.

The results reported here were obtained from samples of frozen pork and beans stored for three months. Storage periods up to one year will be investigated and reported later.

Keeping Qualities

The original pork must be of excellent quality, otherwise it may become rancid during prolonged storage. Accelerated rancidity tests were made, so as to determine how well the fat would keep without waiting 9 to 12 months. Samples were held at room temperature and at 40 deg. F. until deterioration of some part of the product occurred. In all samples the pork kept as long as the beans and sauce, according to the results of eating tests and also of a quantitative modified Kreis test for rancidity. Samples of the frozen pork and beans containing good quality fresh pork, salt pork, smoked pork, and fresh pork treated with gum guaiac or with gum guaiac plus phosphoric acid were compared.

The untreated fresh pork was the only sample for which the Kreis test indicated development of rancidity during 21 days at 40 deg. F. or three days at room temperature, and this one sample was slightly rancid to taste. In another series, in which the original pork tasted slightly but definitely rancid to trained tasters after cooking but before freezing storage, the pork became more rancid during holding at 40 deg. F., but it probably would have been considered edible by most people, even after the beans and sauce had spoiled. It must be noted that the results of these accelerated tests must not be interpreted as a recommendation for long storage at 40 deg. F.

Bacon gave markedly better flavor to the entire product than did fresh pork or salt pork, and showed no deterioration at all after 21 days at 40 deg. F.

It is important to know how long a frozen food can be held after it is removed from freezing storage. The experimental samples showed no significant growth of bacteria after 18 days at 40 deg. F. nor after one day at room temperature, but the count had increased markedly by the second day at room temperature and the 21st day at 40 deg. F. It does not follow that commercially packed products will behave in a similar manner. One commercial sample of frozen baked beans obtained at a local market showed a very high count, at least one-half million, when examined within a few hours after removal from the store holding cabinet.

Even though each ingredient is adequately cooked, the frozen product is not sterile. There is opportunity for contamination of the cooked food during cooling and packaging. Food which is cooled rapidly is less likely to spoil than when it is cooled slowly, because it is within the optimum temperature range for spoilage bacteria for a shorter period. The paper packages themselves are not sterile, and may also introduce contamination.

Every precaution should be taken to assure handling of these foods in as sanitary a manner as possible, particularly after all cooking is completed. The consistency of the product does not permit fast penetration of heat during preparation for the table, and therefore the final heating cannot be relied on to destroy the organisms that may be present.

Formula Used

The formula and procedure for preparation were printed in FOOD INDUSTRIES for May, this year, page 131. Briefly, the packages are filled with 48 percent by weight of cooked beans, 52 percent by weight of sauce, and a piece of pork which weighs ½ oz. before cooking and is cooked 30 minutes at 15-lb. steam pressure. The sauce is made with 270 lb. of 1.035 specific gravity tomato puree, 47 lb. of sugar, 17¼ lb. of salt, 6 lb. of fresh ground onions, 13½ lb. of cornstarch and 5¼ lb. of citrus pectin, with 6 oz. of allspice, 7

(*Turn to page 110*)

* Based on "Information Sheet on Frozen Pork and Beans of the Tomato-Sauce Type," issued by the Western Regional Research Laboratory, Bureau of Agricultural and Industrial Chemistry, U. S. Department of Agriculture, Albany, Calif.

Meeting the Safety Problem

By RALPH J. CROSBY, Safety Engineer,
Marsh & McLennan, Inc., New York, N. Y.

There are two requirements—know what may cause accidents and take steps to "cure" the causes. The author gives practical suggestions which the management of food plants of any size may follow in developing a safety program

THERE are certain minimum requirements for any worth-while safety work, regardless of size of operations. In the briefest of terms, these requirements are: (1) Knowing the probable causes of accidents in your business, and (2) doing something to prevent these unsafe practices from actually existing.

In attempting to describe the steps that should be followed in setting up such a program, it will be necessary to talk in the terminology of a safety engineer. The details may sound elaborate and technical, especially for the plant of say ten to fifty employees. But the smaller the plant the easier it will be to follow the suggestions and the less time will be required to provide the background essential for effective direction of safety efforts. To establish this background, time will be required. It is at this point that even the smallest organization could advantageously use the services of a safety man, someone who has had experience in the determination of accident facts. The small plant will have comparatively few accident hazards, and the analysis will be far more simple in actual performance than it sounds in description.

Classify the Hazards

It is recommended that a business be subdivided for identification and classification purposes in a manner that will permit of allocation of probable accident occurrences. This subdivision may be by plant, floor, department, area, operation, job, machine, substance, tool, object or any other agency that will definitely identify the location or association of accident hazards. These hazards are principally the unsafe practices that have caused accidents, or which would cause accidents if permitted to exist. Unless unsafe acts or conditions are determined, very little can be done about preventing the recurrence of accidents to other employees—new employees cannot be told what to do or what not to do in order to work safely; supervisors and foremen will not know specifically what to look for as evidence of chance taking on the part of men under their supervision.

An analysis, therefore, should be made of both the physical conditions and the employee activities within each subdivision for the purpose of determining the unsafe working practices or mechanical hazards that might exist and which would probably result in serious injuries or costly damage.

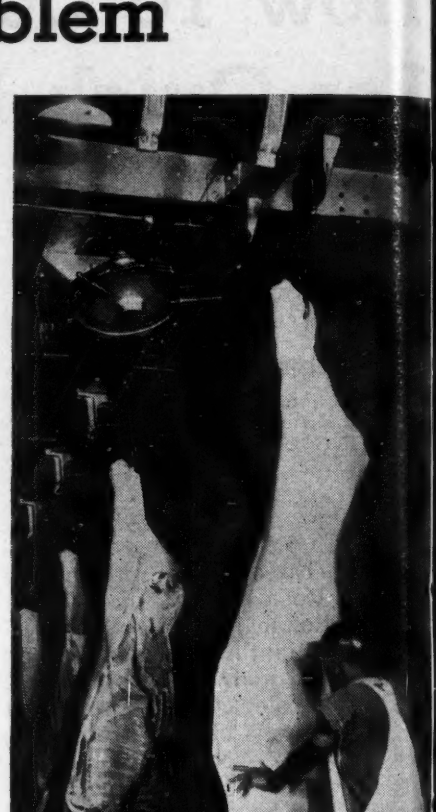
These probable sources of accidents, once determined, should be listed for each agency selected. By agency I mean the substance, object or location chiefly involved or most closely identified with the unsafe act. I recommend listing these unsafe practices because they can be so readily forgotten and may not be recognized until an accident does occur. It will take time to determine these unsafe practices, and this time should not be lost because we failed to make a record of our findings.

It is recommended further that the unsafe practices listed for each agency be numbered so that in the tabulation and analysis of future accidents these numbers can be used as practical means of coding information. Coding is a time saver in tabulating accidents and provides a means of using the cumulative data.

Accident Analysis

An example of the association of agency and unsafe practice may be helpful. Assume that in a plant manufacturing an article which is put up in bottles that the bottles or jars have been selected as an agency. The probable causes of serious injuries most closely associated with the handling of bottles or jars might be:

1. Failure to watch for cracked bottle or broken glass.
2. Throwing broken glass into waste receptacle instead of depositing carefully.
3. Attempting to catch falling bottle or glass.
4. Failure to protect hands when picking up broken glass.
5. Failure to remove broken glass from working spaces.



Pushing a beef carcass along an overhead conveyor is not an exciting operation, but there is enough danger to justify this man's wearing a hard fiber helmet. If for any reason the trolley came off the track and fell on the workman's head, the helmet would prevent a cracked skull

Another agency selected might be the filling machine or similar machines such as capping, wrapping or sealing machines. Associated with the operation of these machines are the following unsafe practices:

1. Failure to watch fingers or clothing when necessary to work in close proximity to moving parts of machine.
2. Starting machine without warning.
3. Making adjustments, cleaning, repairing or removing jammed objects while machine is operating.

4. Operating machine without authority.
5. Allowing material to jam or pile up or feed too rapidly.
6. Allowing moving parts provided with guards to be unguarded.

A similar list could be prepared for such selected agencies as cases or cartons, barrels, hand trucks, ladders, conveyors, elevators, tanks, hose, stairs and platforms.

To what extent a manager can complete an analysis of this kind will depend partially on his operating experience and partially on the amount of concentrated time he is willing to give to the work. He can be assisted through the use of the Safe Practice pamphlets of the National Safety Council. His insurance engineer should be able to give him valuable help, but without the services of an engineer the manager will find that he must devote some continuous time to this part of the development of his accident-prevention program.

Another source of information on the causes of accidents is available from the analysis of past accidents. If the data are available, each accident should be analyzed to determine the unsafe practices involved. This information should be added to the list resulting from the job analysis.

Corrective Action

The second step is to make use of this data and follow through on the corrective measures. The information on unsafe practices should be made available for distribution to supervisors or individual employees. If properly coordinated, the employee will receive only that part of the tabulation that concerns his particular job. The employee or supervisor can be asked to check the items listed, and in some cases it may be advisable to have him turn in at regular intervals a signed copy of the list indicating that the items have been checked and any violations corrected. The effect of this repeated checking for unsafe practices or conditions will create an attitude of safety consciousness that should help to stop other chance-taking impulses.

This same list of unsafe practices is the nucleus of an instruction sheet for new employees. It may be in the form of a mimeographed copy, but it nevertheless tells the new man specifically what he must do, or must not do, to avoid accidents. It provides something tangible that will back up the manager's statement to a new man, "We don't want accidents in our business."

This list provides the manager with a ready reference that eliminates the need for taxing his memory so that a quick check of operations and conditions can be made in a minimum amount of time. This checking time is probably the occasion when more real prevention work can be done than at any other period in a safety program. This is the opportunity for really cashing in on the time given to making the job analysis.

Investigate All Accidents

So far we have considered only what can be done with the information at hand. Accidents may still occur in spite of all our efforts. How can the occurrence of an accident be used to advantage in the effort to prevent future accidents?

In the small plant it is recommended that every accident be thoroughly investigated. This includes not only so-called reportable cases but every first-aid case. The information maintained on first-aid cases may be modified depending upon the circumstances under which the accident occurs.

If the first-aid case occurs in a manner that you can rightfully assume would probably result in a serious injury in event of a recurrence, then it should be treated in respect to recording and corrective action in the same manner as an actual serious case. For example, an employee irritates his eye slightly while preparing a washing solution for cleaning the floor. Only first aid is necessary to relieve the trouble as far as the injury is concerned. However, failure to use the protective goggles and gloves provided for this operation is the cause of the accident, and this fact should not be forgotten. A future occurrence could easily be a serious caustic burn and probable impairment to sight.

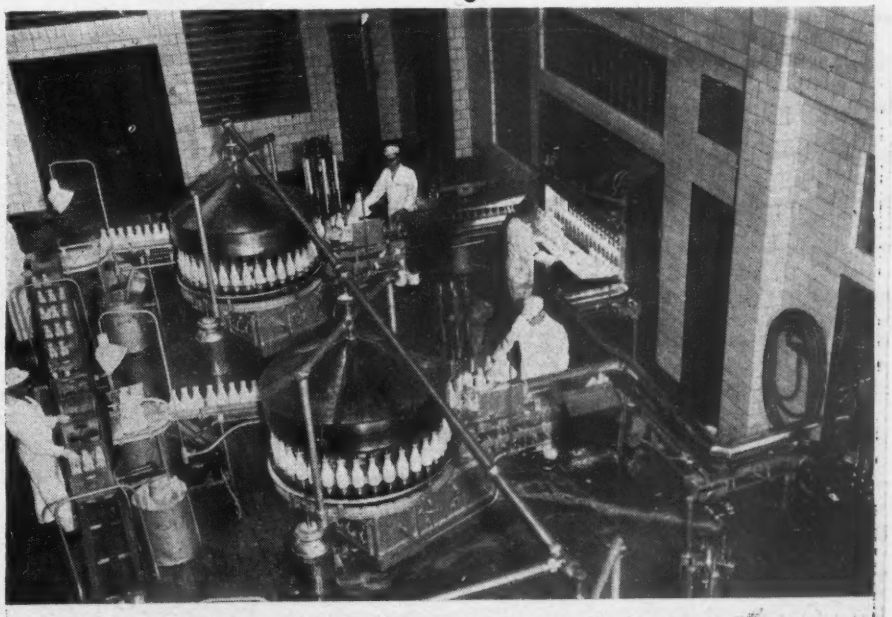
Talk to Each Employee

As a part of the corrective action procedure, the manager should take the opportunity to talk personally with each individual. He should endeavor to establish the fact that the employee understands the company attitude on safety and agrees that the instructions issued are practicable and that it is reasonable to expect that he will make an honest effort to abide by them.

Personal talks of this kind take the place of group meetings in larger organizations, but they have the advantage of creating a better understanding between management and employee.

If an accident should occur from one of the causes already included in the list which has been given to the employees, a personal talk will determine whether or not disciplinary action is required, or whether the accident occurred because of a lack of understanding of instructions or a failure to appreciate the extent of the hazard.

If a manager will follow this procedure and then take every advantage he can through contact with members of the local safety council to maintain his own interest and enthusiasm in the work of accident prevention, I believe he can successfully meet his safety problems.



Bottling milk looks like a very safe operation. But injuries in handling bottles or jars in any food plant can result from failure to watch for cracked or broken bottles, attempting to catch a falling bottle, failure to protect hands when picking up broken glass, failure to remove broken glass from working spaces and throwing broken glass into waste receptacle instead of depositing it carefully. In left foreground of picture is closed receptacle for broken bottles which overcomes the latter hazard.

Easy Way to Schedule Trailer Maintenance

Preventive maintenance for shuttle semi-trailers is complicated by the interchange of tractor-trailer units. Trailers must be checked for greasing and inspection separately and by other means than mileage run

SOME visible record on the semi-trailer itself of what service work has been performed on it is the key by which an adequate preventive maintenance system can be set up to take care of semi-trailers used in shuttle service in handling food products. Shuttle service is the movement of semi-trailers between warehouses in the same or adjacent cities in which the tractor is kept running almost full time with a loaded trailer while other trailers are being loaded and unloaded.

While such a procedure utilizes fully one of the important inherent advantages of semi-trailer operation—the ability to keep the tractor working almost full time—it makes it difficult to keep track of each individual semi-trailer so far as the mileage run is concerned. Each time the tractor is disconnected from one trailer and connected to another, and this may occur several times a day, the identity of the train made up of one tractor and one semi-trailer is lost.

It is easy enough to keep a record of the tractor since it has the recording speedometer to show the daily mileage run. This can be obtained in but one calculation by subtracting the day's starting speedometer reading from the day's finishing reading.

But it is different with the semi-trailer, which has no separate mileage recording device of its own unless it is equipped with a trailer axle hub odometer (not common practice). It is possible to obtain the individual trailer mileage on the trip basis by taking the mileage of the tractor on each trip, since the tractor and trailer mileage is the same for any given trip. However, with each semi-trailer possibly working with several different tractors on the same day, this would entail considerable paper work. Since the wear of both tractors and trailers is measured more closely by the mileage run than with any other yardstick, the service work done on the trailers should be based on trailer mileage.

In fact, most preventive maintenance systems are based on mileage, and it is desirable to base trailer preventive maintenance on this factor provided the mileage under actual operating conditions can easily be obtained. Since this is not the case except when each semi-trailer is permanently attached to one tractor to form a unit whose identity is not constantly changing, many attempts have been made by fleet maintenance men to achieve the desired end by an easy, if roundabout, means.

The system of shuttle trailer preventive maintenance here described and illustrated is one of those easy solutions of the problem. It is based on estimated trailer mileage of 2,300 per week and 10,000 miles a month or 30,000 miles in three months.

Under the preventive maintenance system as set up, each semi-trailer is to be greased every 2,300 miles, or once a week, and inspected once every 30,000 miles or every three months. Certain parts of the semi-trailer are to be lubricated under the weekly greasing operation and certain other parts inspected under the inspection operation to be performed once every three months.

A record of the dates when each of these operations is performed on each trailer is made by waterproof crayon on

Two types of forms used on trailer "neses." That on the right is painted on a carbon steel body and that on the left is painted on a Masonite board fastened to a stainless steel body. The greasing and inspection dates marked on the forms with a waterproof crayon give a visible record of when each operation was last performed and the date when it should be repeated.

TABLE I—Trailer Greasing
(Every Week)

1. Grease spring bolts and shackles.
2. Grease all brake connections.
3. Grease radius rod connections.
4. Oil door hinges and locks.
5. Tighten spring U-bolts.
6. Check all light connections.
7. Check axle transverse alignment.

TABLE II—Trailer Inspection
(Every 3 Months)

1. Grease spring bolts and shackles.
2. Grease all brake connections.
3. Grease radius rod connections.
4. Oil door hinges and locks.
5. Tighten spring U-bolts.
6. Check all light connections.
7. Check axle transverse alignment.
8. Remove wheels; repack wheel bearings and replace grease retainers if necessary; reline brakes if necessary.
9. Tighten all air lines and fittings.
10. Inspect and clean or replace emergency relay valve assembly.
11. Inspect booster.
12. Inspect all spring bolts, shackles and radius rod connections and rebush if necessary. Tighten spring clips.
13. Check wheel alignment. Test wheels for trueness. Adjust differential wheels, if any.
14. Inspect body for side, roof and floor leaks.

the trailer itself. The dates are marked down in order from top to bottom in two columns inside a rectangular form 8 in. wide by 11¼ in. high painted on the trailer nose. The left column is headed "Inspt." for recording the inspections and the right column "Grse." for the greasings.

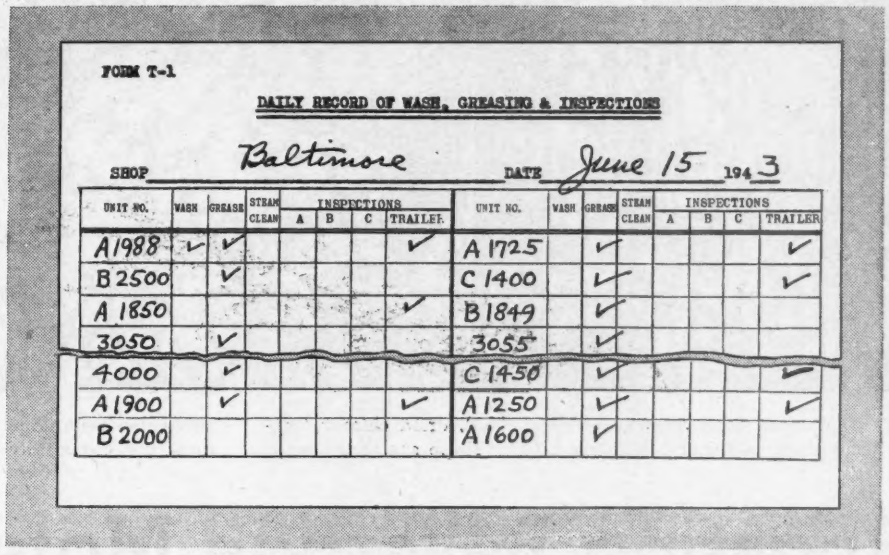
On carbon steel trailers the form is painted directly on the body paint in a contrasting color. On stainless steel trailers, because of the ribs of the metal, the form is painted on a Masonite board and this is screwed to the trailer nose, as shown in the accompanying illustration.

When the waterproof crayon is used, the dates will not rub off when the trailer is washed or be erased by rain or snow when the trailer is in transit. When dates are removed after each column has been filled up so that more recent dates can be substituted, the old dates can be wiped off with a cloth dipped in inexpensive Pyrene fire extinguisher fluid.

There are seven boxes in each of the columns. The greasing column, with one greasing a week, is good for recording seven weeks' greasings. The inspection column, with one inspection every three months, is good for 21 months or almost two years before it is necessary to rub off the dates and start anew. In practice, the trailer is given an inspection, which also includes a greasing, and the same date marked in each of the columns at the top. Then a week later, the trailer is given another greasing and the date marked below the first greasing date.

Each day the shop foreman at the warehouse looks at all trailers lined up at the warehouse platform and greases only those trailers whose last marked greasing dates are seven days or more earlier than that day. This prevents some trailers from being greased too often and others not often enough. The same method of procedure is employed in making the trailer inspections.

The greasing and inspection items covered in the preventive maintenance system described are as listed in Tables I and II.



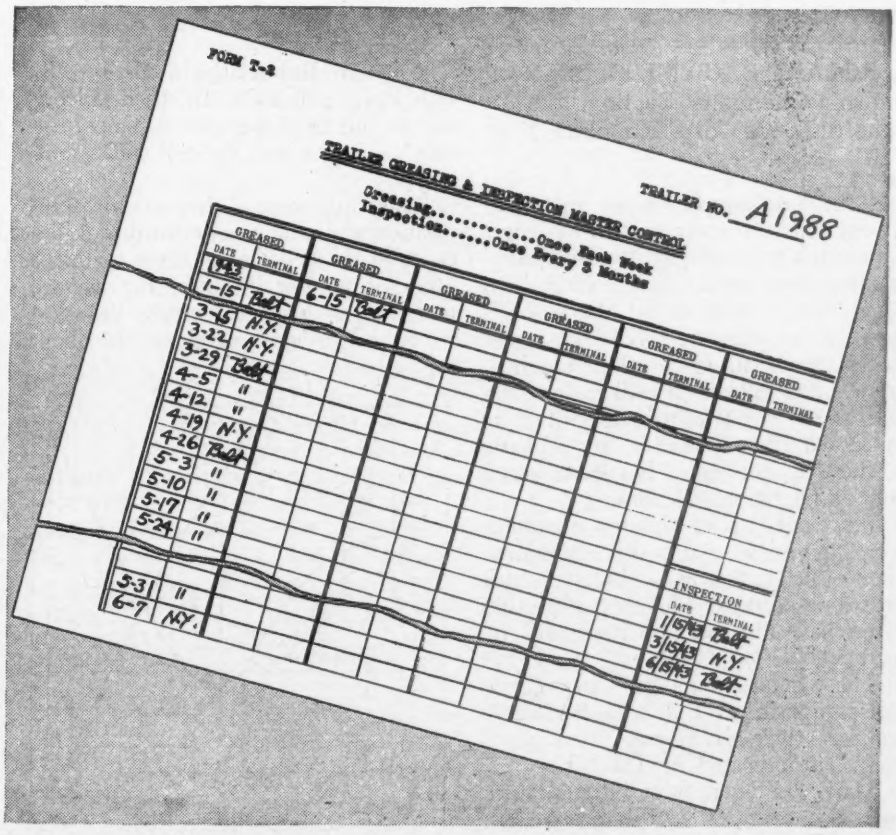
FORM T-1

DAILY RECORD OF WASH, GREASING & INSPECTIONS

SHOP Baltimore DATE June 15 1943

UNIT NO.	WASH	GREASE	STEAM CLEAN	INSPECTIONS A	B	C	TRAILER	UNIT NO.	WASH	GREASE	STEAM CLEAN	INSPECTIONS A	B	C	TRAILER
A1988	✓	✓					✓	A 1725		✓					✓
B 2500		✓						C 1400		✓					✓
A 1850							✓	B 1849		✓					
3050		✓						3055		✓					
4000		✓						C 1450		✓					✓
A1900		✓					✓	A 1250		✓					✓
B 2000								A 1600		✓					

A paper form such as that above is used to keep a written record of the daily trailer greasings and inspections. The same form is used for trucks and tractors. The trailers are identified by the letter prefixes ahead of the numbers. For example, Trailer A1988 is shown on the above form to have received a wash, a greasing and an inspection on June 15, 1943.



FORM T-2

TRAILER GREASING & INSPECTION MASTER CONTROL

TRAILER NO. A1988

Greasing.....Once Each Week
Inspection.....Once Every 3 Months

GREASED DATE	TERMINAL	GREASED DATE	TERMINAL	GREASED DATE	TERMINAL	GREASED DATE	TERMINAL	GREASED DATE	TERMINAL	GREASED DATE	TERMINAL
1943											
1-15	Balt.	6-15	Balt.								
3-15	N.Y.										
3-22	N.Y.										
3-29	Balt.										
4-5	"										
4-12	"										
4-19	N.Y.										
4-26	Balt.										
5-3	"										
5-10	"										
5-17	"										
5-24	"										
5-31	"										
6-7	N.Y.										

INSPECTION DATE	TERMINAL
1/15/43	Balt.
3/15/43	N.Y.
6/15/43	Balt.

To make sure that the shop foremen at the various warehouses do not neglect to grease or inspect the trailers on the proper due dates, a paper form such as that shown here, made out for each trailer by its vehicle number, is kept at the main shop office. The dates on this form are posted from the daily Form T-1 shown above and provide a master control of both trailer greasings and inspections.

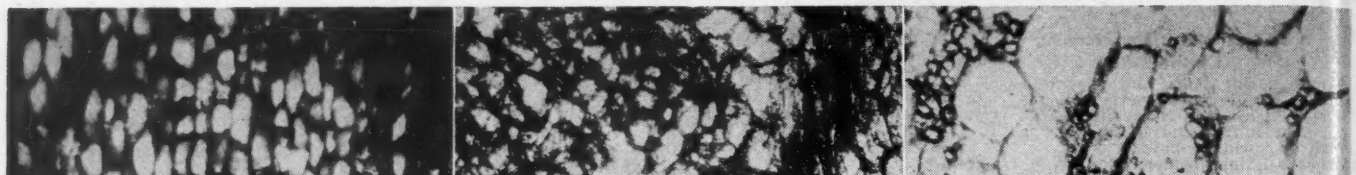


FIG. 1. Washed cross sections of coffee (left), dried chicory (center) and chick pea (right), magnified X95. These specimens were mordanted with tannic acid and stained with ferric chloride to show the comparative cellular structure.

Roasting Beverage Materials*

Differences in the structure and aroma constituents of coffee and roasted cereals affect the heat treating procedures used

By ROLAND E. KREMERS, Director, Organic Chemistry Section, General Foods Corp., Hoboken, N. J.

IN the long search for raw materials from which to make roasted beverage materials, a great variety of plant products have been tried. Cheney[1] states that the recorded instances for the past 75 years alone involve 123 botanical species, representing 38 plant families. From what follows, it will be evident that as far as chemical composition is concerned, the choice of these plants for beverage materials has been based only on haphazard selection.

Representative of the raw materials more commonly used in this country are plants such as wheat, chicory, chick peas and peanuts. Molasses and other sirups have also become important ingredients.

The great variation in chemical composition of these materials, as well as their divergence from green coffee, is indicated in Table I.

Marked differences in internal structure also characterize this group. The coffee bean has relatively small cells, with heavy cell walls. In dried chicory and in the chick pea, for instance, the cells are larger and the cell walls more fragile.

Reflecting these differences in composition and structure are further differences in the behavior of these materials on roasting. For instance, the average end temperatures at which the best flavor and color are developed are about 240 deg. C. (464 deg. F.), for wheat and about 210-220 deg. C. (410-428 deg. F.), for coffee. The sirups char above about 190 deg. C. (374 deg. F.). The nature of the chemical decompositions occurring within the structures is quite different, as is shown, for instance, by pH changes in the water-soluble extracts of these materials which have been roasted to different degrees. Wheat becomes progressively more acid, whereas coffee first becomes more acid, then loses acidity.

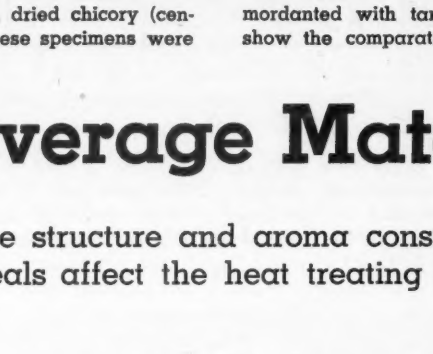


FIG. 2. Effect of the degree of roast on the pH, showing the great difference in the behavior of coffee and a typical cereal, wheat.

What little is known about the chemical constituents of the aromas likewise reflects the individuality of the several raw materials. To facilitate comparisons, the lists of constituents have been subdivided into three groups, shown in Table II.

Group I consists of compounds that are very frequently, if not invariably, produced by the roasting of plant materials for beverage purposes. They are thought to be formed by the partial destructive distillation of carbohydrate materials commonly present in plant tissues. It is anticipated that further search will fill in at least several of the blank spaces in this tabulation.

Group II seems to indicate the occurrence in chicory of a greater number of acids than is found in coffee. The

* Presented before the Division of Agricultural and Food Chemistry, American Chemical Society, Detroit, April, 1943, under the title "Coffee Substitutes."

TABLE I—Composition of Raw Materials[1]

	H_2O (per-cent)	Ash (per-cent)	Fiber (per-cent)	Starch (per-cent)	Total nitrogen-free extract (per-(cent)	Protein (per-(cent)	Fat (per-cent)
Coffee[2]	11	4.5	28.7	0	25	15.7	13.6
Chicory	12.3	4.7	5	0	71	4.9	0.5
Wheat	10.5	1.8	1.8	62	72	11.9	2
Chick peas	10.5	2.9	3.1	49	56	22.6	5.1
Peanuts	5	2.3	2.4	5	9.5	32	48.7
Molasses	20	6.3	0	0	71	2.4	0

[1] For the sake of uniformity, this table is constructed from data given in Winton and Winton, "Structure and Composition of Foods."

[2] Contains also 1 percent caffein and 7 percent of chlorogenic acid.

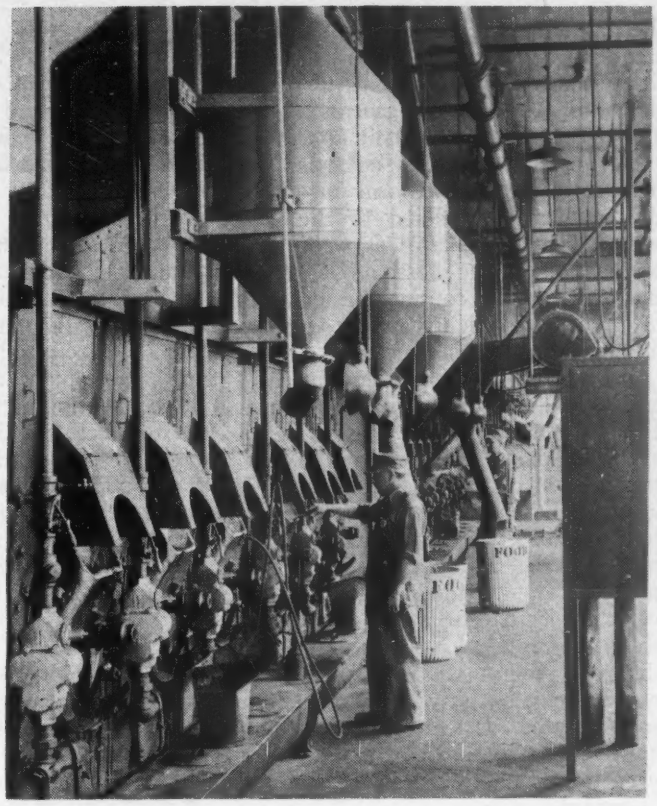


FIG. 3. Wheat roasters and bran-molasses roasters. Modern equipment permits control in roasting cereals and yields a product more nearly uniform in flavor.

universal presence of furfural in roasted materials might indicate the eventual isolation of furoic acid from all roasted products. The position of roasted wheat with respect to these compounds is uncertain. The occurrence of phenolic compounds in coffee, especially in beans which have been roasted to a French roast, is compatible with the presence of chlorogenic acid in the raw material, even though identification of the specific compounds listed in the table is not too well authenticated.

Group III shows some very striking differentiations between the three roasted beverage materials. Coffee has both nitrogen and sulphur compounds in its aroma, and these sulphur compounds distinguish coffee from both wheat and chicory. Nitrogen is present in both wheat and coffee aromas, but coffee contains only cyclic bases, whereas ammonia type bases also are present in wheat.

Roasting Methods

The preceding discussion has touched upon the fact that the raw materials from which roasted beverages have been made differ greatly in physical structure and in chemical composition. It has been indicated that the incipient destructive distillation, which constitutes the roasting process, does not obliterate these differences. Consequently it is readily understandable that each roasted product will tend to have an identity of its own which reflects its particular composition and structure. The rational use of each product in commerce should in turn be based upon these same elements.

In view of the marked differences in raw materials it will be instructive to consider briefly the evolution of roasting technology in order to discover what efforts have been made to adapt the methods of processing to the composition and structure of the raw materials being processed. Only chicory and the common cereals have been used at all extensively in this country and our discussion will be limited to these.

Chicory has the distinction of being one of the few roasted plant materials which is regularly used with coffee. In some localities people prefer the flavor of the combination. Its preparation is a straightforward series of operations dictated by the characteristics of the raw material. Chicory is grown extensively in northeastern Michigan. After harvesting, the fleshy roots are dried and cut to uniform size for the roasting operations.

Unlike chicory, the roasted cereal grains possess flavors which the great majority of people consider incompatible with coffee. In spite of this disadvantage, their low cost has kept them in use to a limited extent on an economy basis. From this background of continued use many attempts have been made to improve the flavor of cereal products to make them acceptable as products to be mixed with coffee in markets where economy is a secondary consideration.

Originally the grains were roasted in a very crude manner. Such products are bitter, often smoky in flavor, and in other ways generally harsh and unpalatable. They tend to be deficient in color and in strength of flavor unless given a rather drastic heat treatment. The introduction of modern machinery has done a great deal to promote uniformity of roast and to eliminate the appearance of smoky or other undesirable flavors due to overroasting.

Malting of Grains

A considerable advance was made when the cereals, particularly barley, were malted prior to roasting. Compared to untreated cereals, properly prepared, roasted malted barley exhibits a richer color and a reduction in the bitter flavors. However, the process is difficult to control because the malting operation introduces numerous variables into the material and uniform maintenance of the proper degree of roast is hard to achieve. In normal times the consumption of roasted malted barley beverages in this country is almost negligible, but they are more popular in Europe.

In 1894, C. W. Post offered to the trade a cereal beverage that was not developed as a product to be mixed with coffee, but as a complete beverage with no attempt to simulate the flavor of coffee. This product, Postum Cereal, is made by combining roasted wheat with a roasted mixture of wheat-bran and molasses. From a technological standpoint, it may be regarded as a clever combination of the two stages which preceded it, *i.e.*, the straight cereals and the malted cereals. The roasted wheat component now has the advantage of the uniformity obtainable with modern machinery. The molasses is the raw material equivalent of the dextrins and reducing sugars in malted barley. The bran largely serves as a vehicle for the proper roasting of the molasses and corresponds to the bran, unconverted starch, proteins, and so forth, of malted barley grain. Since the composition of molasses and bran is quite constant, adequate control during roasting is much more easily achieved. Moreover,

the proportions of the two components can be altered at will, so that the flavor of the roasted molasses tends to soften the bitter flavors of the roasted wheat. The development of Instant Postum in 1911[2] marked a further advance, not only in the physical form in which the product was offered to the consumer, but in its flavor as well. The evaporation of the Postum Cereal extract volatilizes a considerable quantity of acidic constituents and produces a milder, more popular beverage.

During the 20 years between 1910 and 1930 a considerable number of patents were issued in the roasted beverage field, many of them to J. L. Kellogg.[3] Most of these were variations of what might be called the Postum pattern. That is, the main effort was directed to the use of sirups other than molasses and to modifications in the vehicles of roasting such sirups. One Kellogg patent[4] was based on an entirely different premise. It proposed the use of decaffeinated fatty oil, pressed from roasted coffee, as a means of imparting coffee flavor to cereal beverages. However, the oil had a distinct tendency to go rancid.

Study of Aroma

Researches into coffee aroma and chicory aroma by Staudinger[5] and Reichstein[6] were published in 1928 and 1930, and subsequently confirmed by Frey and Johnston[7] in 1938. Undoubtedly these studies will inspire practical developments of real value, but the goal of a synthetic coffee aroma which can be used to impart a true coffee flavor to a cereal or other base apparently has not been realized. Staudinger's emphasis on the importance of sulphur compounds in coffee aroma appears justified. However, the identified sulphur compounds do not by themselves possess a coffee-like odor. For instance, furfuryl mercaptan in great dilution exhibits an unmistakably skunk-like odor. To reconcile this inconsistency, Staudinger postulated the existence of unstable addition compounds formed by the mercaptans with the aldehydes or ketones which are also present, these addition compounds being credited with carrying the typical coffee aroma. However, even this extension of the known facts about coffee aroma does not provide an adequate solution of the problem. For one thing, raw wheat contains as much sulphur by analysis as does raw coffee, and the roasting of wheat produces the same aldehydes and ketones as are found in roasted coffee. Still the aromas of the two products are entirely different. Moreover, synthetic aromas compounded according to the Staudinger disclosures do not really reproduce coffee aroma.

TABLE II—Aroma Constituents

	Compound	Coffee	Wheat	Chicory
Group I	Acetaldehyde**	X	X	X
	Acetone	X	X	X
	Methanol	X	X	X
	Diacetyl	X	X	X
	Acetic acid	X	X	X
	Furane	X		X
	Furfural	X	X	X
	Furfuryl alcohol	X		X
	Maltol	X		X
	Oxymethyl furfural			X
Group II	Isovaleric acid	X		X
	Lactic acid			X
	Pyruvic acid			X
	Furoic acid			X
	Vinyl guaiacol	X		
	2, 3-Dioxyacetophenone	X		
Group III	Ammonia	–	X	–
	Trimethylamine	–	X	–
	Pyridine	X	–	–
	Pyrazine		X	–
	Methyl pyrazines	X	X	–
	Hydrogen sulphide	X	–	–
	Methyl mercaptan	X	–	–
	Furfuryl mercaptan	X	–	–

*Data on coffee are from Staudinger and Reichstein, confirmed by Frey and Johnston; those on wheat are from unpublished researches of The Postum Co., and data on chicory are from Reichstein and Beitter (see bibliography).

**X indicates the occurrence of the compound named, blank spaces indicate uncertainty as to its presence or absence, and the dash indicates that it is not present.

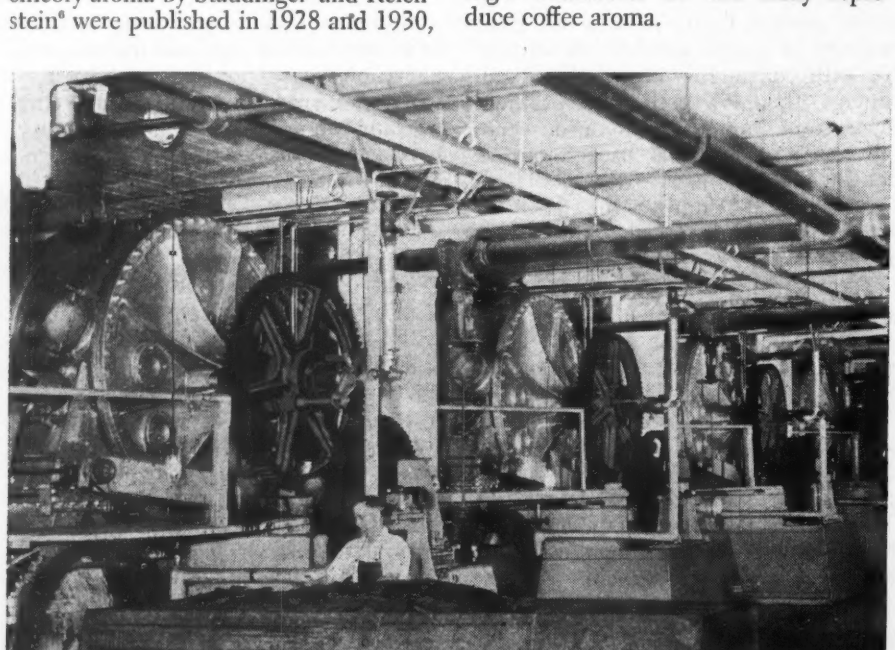


FIG. 4. The use of vacuum drum dryers to dry a concentrated extract provides a beverage material which is quickly soluble and also results in a mild flavor.

Recent Developments

During the period when the sale of coffee was restricted, due to critical conditions in world trade, there was an extraordinary interest in this country in roasted beverages other than coffee. At that time General Foods offered a new product to be used with coffee. This product was developed on the premise that, so long as a reasonable supply of coffee was available, the consumer would rather have an extender than a substitute. It was believed that such a product should have a rich color, good body, a relatively neutral flavor, and a light aroma. A beverage material with these characteristics was developed from a cereal base with the addition of cocoa byproducts. In the limited market in which this product appeared, it was temporarily very well received during the more acute stage of the recent coffee shortage.

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2. W. H. Post, U. S. Patent 1,031,962, issued July 9, 1912.
3. J. L. Kellogg, U. S. Patent 1,163,759, issued December 14, 1915; also J. L. Kellogg and B. Kazmann, U. S. Patent 1,349,000, issued August 10, 1920.
4. J. L. Kellogg, U. S. Patent 1,605,115, issued November 2, 1926.
5. H. Staudinger, British Patent 260,960, issued February 22, 1928, to Internationale Nahrungs- und Genussmittel-Aktiengesellschaft.
6. T. Reichstein and H. Beitter, *Berichte der deutschen chemischen gesellschaft*, vol. 63, 816-26, 1930.
7. W. R. Johnston and C. N. Frey, *Journal of the American Chemical Society*, vol. 60, 1624-27, 1938.

Infrared Dehydration of Meats And Vegetables Tested

By F. M. TILLER, E. E. LITKENHOUS and WILFRED TURBEVILLE
Department of Chemical Engineering, Vanderbilt University, Nashville, Tenn.

Preliminary investigations of infrared dehydration of carrots, sweet potatoes, turnip greens, beef and pork were successful. Generally 5 to 25 minutes has been required for complete drying. The author gives results and the theory in brief.

DURING the past four years, the industrial utilization of infrared radiation has steadily increased. Although most of the existing installations are used for baking paints, other applications in dehydration and drying processes have been developed. Radiant heating largely owes its success to the high rates of heat transfer that are obtained as compared to those of conventional hot-air ovens. Since infrared has been employed successfully in some evaporation processes, an investigation of infrared dehydration of vegetables was begun this spring in the Chemical Engineering Laboratories at Vanderbilt University. The preliminary investigations were unexpectedly successful, and the results are presented in this paper.

The primary purpose of infrared radiant heating is to increase the rate of heat flow over the rate obtainable with ordinary convectional heat transfer. Infrared lamps have been used in preference to incandescent lamps because the infrared filaments operate at lower temperatures and consequently have a longer life.

In dehydration work, the primary information desired is the amount of moisture removed as a function of time. The drying time depends upon the rate of evaporation, which is determined by the net heat input into the drying solid. The net heat input is limited by the radiation absorbed by the material and the gain or loss of heat to the surrounding air. The most important factors affecting the net rate of heat transfer are as follows:

1. Intensity of radiation. This has been given in watts per square inch[2, 5], but is probably better expressed as B.t.u. per hour per square foot.

2. Overall absorptivity of material. The overall absorptivity is the ratio of the rate at which radiation is converted into heat to the radiant intensity incident to the surface. It depends upon the surface reflection characteristics, internal absorption characteristics, and the thickness of the material.

3. Surrounding air temperature.

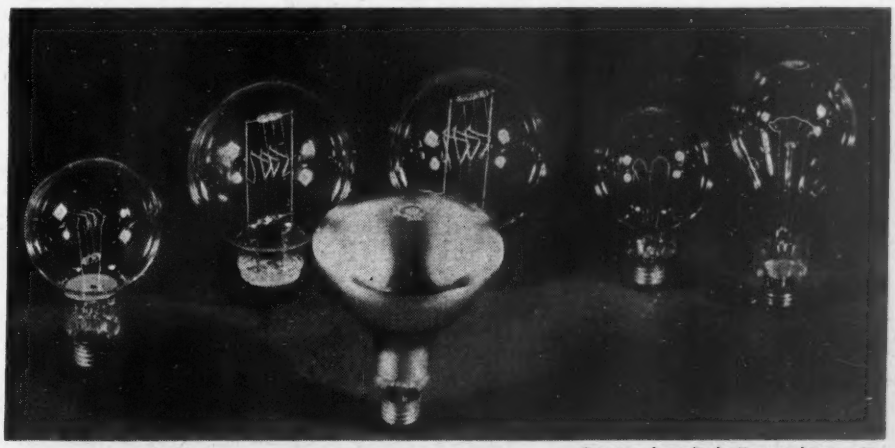
4. Air circulation.

The average industrial intensities vary from 1,000 to 3,000 B.t.u. per hour per square foot. To find the actual absorption, these figures must be multiplied by the overall absorptivity. To obtain the highest intensity, it is necessary either to use high wattage (1,000 watt) lamps or else to place low wattage (250 watt) lamps on close (6-in.) centers. For thin metals[5] (12–28 gage) it has been shown that the effectiveness of utilization of radiation increases as the intensity is increased. Presumably this would also be true for dehydration. The overall absorptivity of wet foods is probably high as water itself is a good absorber of near infrared radiation.

The air temperature is largely determined by the insulation and air circulation. In some commercial ovens, air temperatures as high as 300 deg. F. have been obtained with limited air circulation. Generally, the air movement has been kept to a minimum, usually just enough to remove the vapors that are given off.

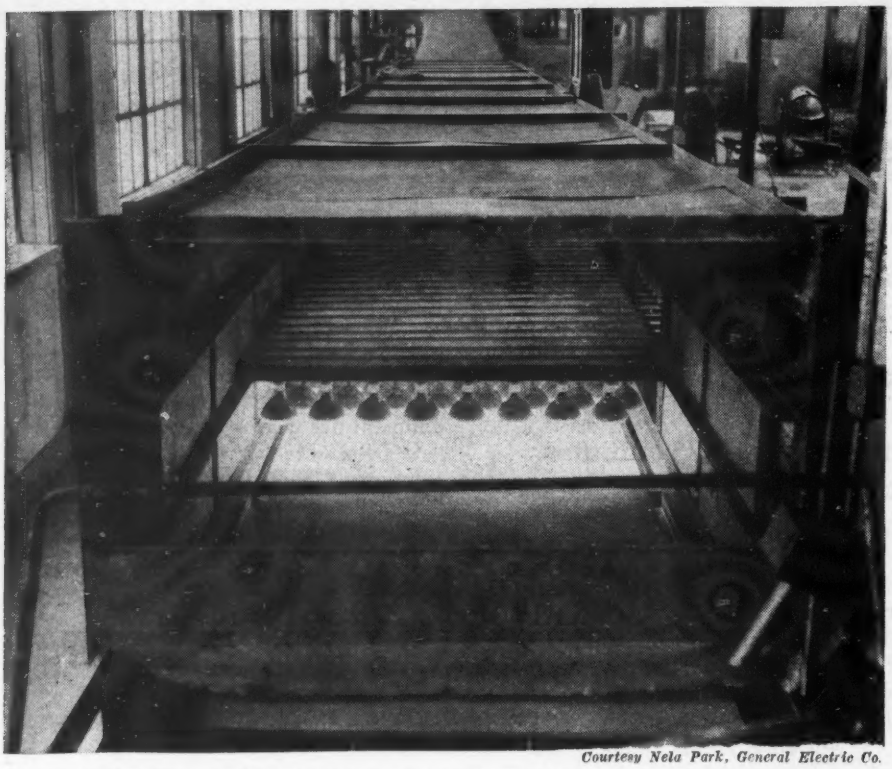
The first infrared ovens consisted of pipe supports for holding the lamps and were devoid of insulation. It was thought that all the radiation passed directly to the stock and that there were little or no energy losses to the surroundings. Experience changed these original ideas, and well-designed ovens of large size are now fully insulated. As the success of using a high-cost fuel is determined by the efficiency with which it is used, the enclosure of the lamp assembly to conserve heat is of importance.

The temperature distribution throughout an object depends upon the uniformity of radiation and thermal conductivity. Because of nonuniformity of radiation, conveyorized operation has been essential even where the radiated materials have been metals with high thermal conductivities. While most solids in drying processes have small thermal conductivities, the vaporizing liquid will tend to keep the temperature uniform.



Courtesy Neta Park, General Elect. ic Co.

FIG. 1. General Electric infrared lamps. Foreground, 250-watt reflector lamp of the type used in the dehydration investigation. Background, 250-watt, 500-watt and 1,000-watt, triangular-filament lamps and 250-watt horseshoe-filament short- and long-necked-base lamps.



Courtesy Nela Park, General Electric Co.

FIG. 2. Installation of 650 of the 250-watt General Electric reflector lamps mounted on 6-in. centers. Wallboard passes through the oven on a conveyor.

Industrial Equipment

Most equipment falls into the following classifications: (1) 240 to 375-watt lamps in open reflectors, (2) 250-watt lamps with self-contained, aluminum reflecting surfaces, and (3) 1,000-watt lamps in reflectors sealed with a lense.

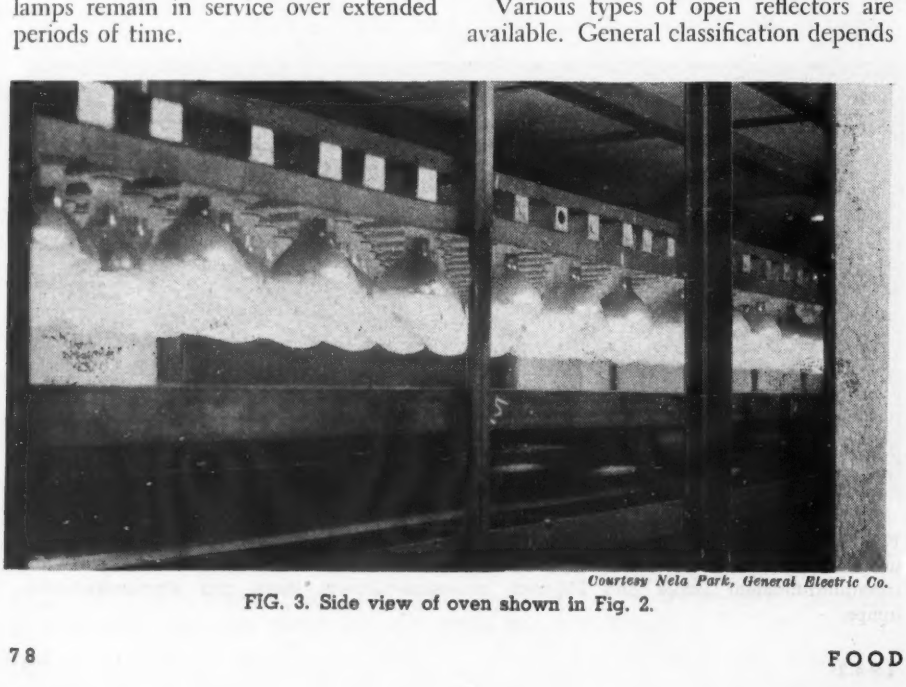
Infrared lamps have either tungsten or carbon filaments. Carbon filaments show considerable depreciation after approximately 100 hours of operation. Tungsten lamps[8] possess a high overall efficiency and are considered to be more economical in the long run. Tungsten lamps remain in service over extended periods of time.

The radiation from the filament must be directed toward the work, and a reflector surface is required. One of the best and most simple types of reflectors is contained in the reflector lamp illustrated in the foreground of Fig. 1. These lamps require no additional reflector surface, and they may be placed on closer centers (about 6 in.) than other lamps requiring reflectors. In this way the highest heat densities are obtained. As no dust or fumes can be deposited on the reflector surface, the cleaning of reflectors is obviated.

Various types of open reflectors are available. General classification depends upon the shape of the surface (spherical, parabolic, corrugated, and so forth) and the diameter (7 to 12 in.) and depth (3 to 16 in.) of bowl. In deep-bowl reflectors, a good control of energy is obtainable, but the diameter is necessarily large and high energy concentrations cannot be obtained. In general, the intensity distribution for open reflector lamps has not been very good.

The sealed-lense lamp represents an improvement over the open-type lamps. Deposition of fumes does not occur on the reflector surface, and maintenance problems are simplified. Unless fume deposition is very heavy, as is sometimes the case when lamps are near paint-spray booths, the cleaning of the lenses is not difficult. The lense also gives a more uniform dispersion of the radiant energy and keeps fumes away from the hot bulbs. The glass must necessarily have good infrared-transmission characteristics. These units are offered in 1,000-watt sizes with vaporized aluminum reflectors.

Reflector surfaces are chiefly finished with gold, alzac aluminum and vaporized aluminum. At first, gold was used almost exclusively, but it has now partially been replaced with aluminum. Some lamp users found that the gold diffused into and alloyed with the base metal, causing a "vanishing gold plate" when the reflectors remained at relatively high temperatures in well-insulated ovens. Others have found it necessary to replate the lamps periodically, because the gold does not stand up well under frequent cleanings. Alzac aluminum is more rugged than gold but does not have as good reflection characteristics. Recent tests have indicated that vaporized aluminum has overall reflection characteristics superior to gold in the near-infrared range of radiation.



Courtesy Nela Park, General Electric Co.

FIG. 3. Side view of oven shown in Fig. 2.

Experimental Equipment

The experimental dehydration of meats and vegetables was carried out in an oven with walls of sheet metal. The top was sometimes covered with insulating board in order to restrict air flow and increase the oven air temperature. The lamps were placed on 60-deg. centers, about 5 to 6 in. apart. This arrangement of lamps gave a high heat density of approximately 2,500 B.t.u. per hour per square foot. No attempt was made to vary the intensity.

Materials to be dehydrated were obtained from neighborhood grocery stores. Carrots, sweet potatoes, turnip greens, pork and beef were dehydrated. The vegetables were sliced by machine to obtain uniform thickness, while the meat was sliced to the proper size by hand. The vegetables were not blanched, while the meat was precooked

according to specifications given by Kraybill.[4] This consisted of cutting the meat into particles of approximately ¼-in. size and then precooking at 165 deg. F. for 30 minutes. The meat was then drained and placed directly in the oven.

Before the samples were placed in the oven, the lamps were operated until the air temperature became constant. Serious errors result when the air temperature varies in a batch oven. Such errors generally show up in time-temperature curves, where the temperature of the material continues to climb above its normal maximum as the air temperature rises. The air temperature was controlled by the degree to which the door was opened. After reaching a constant oven air temperature, the materials were placed in the oven on a wire screen resting directly on a balance. Readings were taken at intervals without disturbing oven conditions.

Experimental Results

The vegetables generally required from 5 to 30 minutes for dehydration depending upon the thickness, which ranged upward to ¼ in., and also upon the air temperature, which was varied from 140 to 220 deg. F. The characteristics of the drying curves are similar to those encountered in the drying of most solids.[1] The rate of drying increased to a maximum and then dropped as the solid approached dryness. The results of dehydrating sweet potatoes, turnip greens, and carrots are shown in Figs. 4, 5 and 6. The turnip greens required less time primarily due to their thinness. The variation in air temperature did not greatly affect the drying rates. This would be expected, as only a small portion of the heat is transferred by convection.

In Fig. 7, the effect of thickness on the drying of carrots is shown. The time required to reduce the moisture content to a given value is approximately proportional to the thickness. Thirty minutes was required to remove 85 percent of the original moisture for 0.25-in. carrots and only 5.3 minutes for 0.044-in. slices. The ratio of the times is 5.66 and the ratio of thicknesses 5.68 for this case. However, the thicker slices became too hot on the surface after 27 minutes had elapsed and they began to scorch. Thus it would not be possible to completely dehydrate 0.25-in. slices at the high intensity used. It would be necessary to lower the intensity or complete the job with hot air. More complete data would be required to establish the exact relation between drying time and thickness. If, as is indicated, the drying time is proportional to the thickness, the capacity of a radiant heat oven would not be affected by the thickness of the slices. If the thickness were doubled for an existing installation, the conveyor speed could be halved, and the capacity would not be changed.

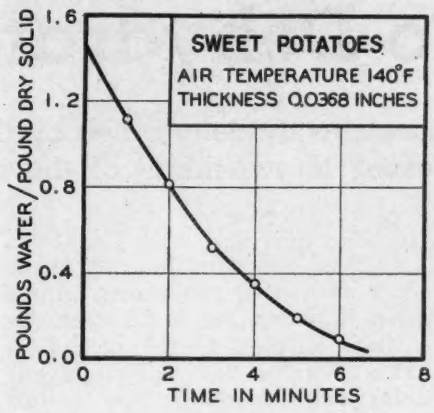


FIG. 4. Moisture content vs. time for sweet potatoes dehydrated by infrared lamps.

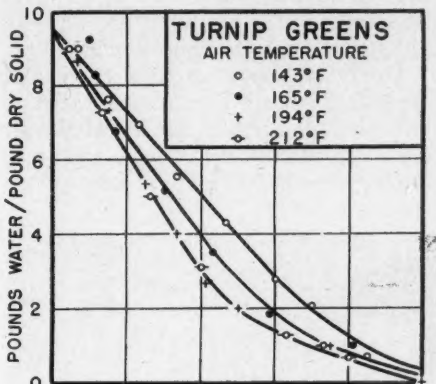


FIG. 5. Moisture content vs. time for turnip greens dehydrated by infrared lamps.

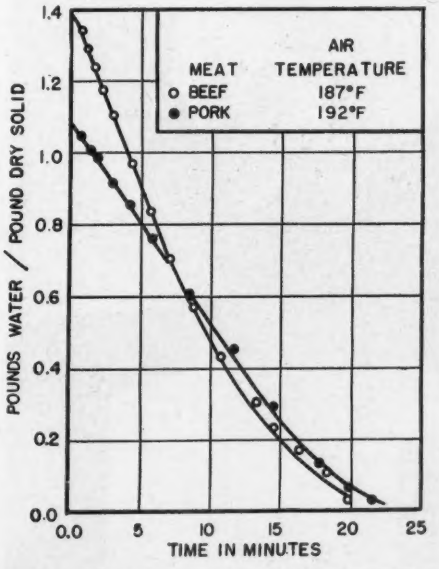


FIG. 8. Moisture content vs. time for beef and pork dehydrated by infrared lamps.

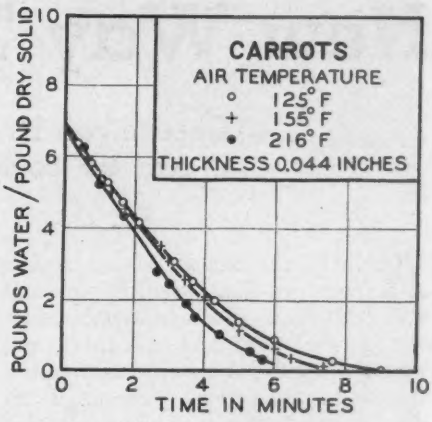


FIG. 6. Moisture content vs. time for carrots dehydrated by infrared lamps.

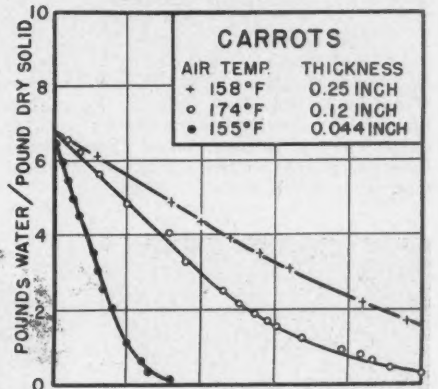


FIG. 7. Effect of thickness on time of dehydration of carrots by infrared lamps.

In Fig. 8 are shown the results of dehydrating beef and pork. Originally the pork contained 2.04 lb. of water per pound of dry solids, and the beef consisted of 4.16 lb. of water per pound of dry solids. After precooking, the moisture contents of the pork and beef were reduced respectively to 1.11 and 1.39 lb. of water per pound of dry solids. With an oven temperature of about 185 deg. F., the time of drying for both beef and pork is around 23 minutes. The dried products rehydrated in 15 minutes to the same moisture content as obtained after precooking. A large portion of the rehydration occurred in the first five minutes. The dried meat had good flavor. At the present writing, samples of the dehydrated beef and pork have been sitting in open beakers without any apparent deterioration in flavor or odor.

Commercial Ovens

The oven shown in Fig. 2 would be an excellent type for dehydration. This would be relatively inexpensive and easy to maintain. While the authors recognize that the data thus far ob-

(*Turn to page 121*)

New Way To Dehydrate Cheese

Cheese can be more directly dehydrated by this method. And it can be compressed to two-thirds of the original volume*

AMERICAN cheddar cheese usually contains more than 33 percent water, removal of which would reduce the weight by at least one-third, and would also make it possible to compress the cheese into a smaller volume. These savings are important under wartime shipping and storage conditions, and therefore the commercial dehydration of cheese has been undertaken.

There are difficulties, however, in any direct method of dehydrating natural cheese, including loss of fat caused by melting, lumping of the ground or grated particles, and uneven drying. Consequently, until the new method was developed it was necessary, in order to dehydrate a full-fat cheese, either to process the cheese into a milky paste that could be spray dried, or to grate skim milk cheese for drying and add the fat after the dehydration was completed.

Under the new method, which is applicable to any type of hard cheese, only properly cured cheese, selected with particular attention to flavor, and thoroughly cleaned, should be used. This is blended as in the manufacture of process cheese. The subsurface portion of the rind, if clean and edible, can be used in the blend.

Dehydration Method

The first stage of the new process consists of grating the cheese and then drying it at room temperature to harden the surfaces of the particles so that the fat will not exude and the particles will not cohere. The second stage is final drying at an increased temperature in some type of dehydrater. So far the method has been tested and found successful in small scale experiments, but has not been used for quantity production.

In the first stage, the cheese is cut into rectangular bars and grated by means of a mechanical grater into small, thin flakes. These flakes are placed directly on trays or other flat surfaces, spread in a layer of uniform thickness weighing from 0.35 to 0.5 lb. of cheese per square foot.

A suitable temperature for the first stage of drying is from 72 to 82 deg. F., but it has been accomplished successfully at temperatures as high as 93 deg. F. To hasten the drying, the layer of cheese may be inverted when the particles on top become crisp.

All operations, including the cutting and grating, are conducted in a strong current of air, which may be supplied by fans placed about 4 ft. above the trays, or which may be blown directly across the layers of cheese. A satisfactory rate of first-stage drying was attained with the relative humidity of the air between 25 and 35 percent, but drying was much faster when the relative humidity was 10 to 12 percent.

Particles Case-Hardened

Under these conditions, the particles acquired some crispness and their surfaces hardened sufficiently to prevent exudation of the fat, lumping of the flakes, and loss of the volatile flavors. The moisture content was reduced to about 10 percent in from 30 to 90 minutes, the time depending upon control of the specified conditions, especially the relative humidity of the air. Preliminary drying was also accomplished successfully when the relative humidity was as high as 50 to 55 percent, but

* This method was developed by Dr. George P. Sanders, Division of Dairy Research Laboratories, Bureau of Dairy Industry, Agricultural Research Administration, and the information given herewith is based on a United States Department of Agriculture release and additional information supplied by Dr. Sanders.

The blocks of compressed, dehydrated American cheddar cheese shown here contains but 3 percent water, compared to the 36 percent water content of the ordinary cheese shown at the left. In addition, this compressed, dehydrated cheese requires only 53 to 58 percent of the storage or shipping space required by the original round cheese.

under such conditions the time was increased to as much as two hours.

The rate of drying can be increased and the required volume of air decreased by directing the flow of air downward from openings placed rather closely above the layer of cheese. This is particularly useful in locations where dehumidification of the drying air may prove to be necessary.

Second Stage Drying

In the second stage of dehydration, the trays of partially dehydrated cheese are placed in a tunnel or chamber dryer. Dehydration is then completed in a strong current of air, the temperature of which is gradually increased to about 145 deg. F. or somewhat higher. Temperatures as high as 180 deg. F. have been used successfully, and result in a drier product. In the small-scale experiments, the moisture of the cheese was reduced during this final drying to less than 3 percent in 1½ to 2 hours. The product is then cooled on the trays to cause the fat to solidify.

Compression

The dried cheese flakes may be compressed into rectangular bars or cakes, in order to reduce the volume. A pressure of 1,000 lb. per square inch, or slightly less, at a temperature of about 50 deg. F., should be used.

The air is squeezed out by compression and the density of the product is thus increased to approximately that of the original cheese. The reduction in weight accomplished by dehydration is about 35 percent and sufficient compression will reduce the original volume of the cheese by 35 percent. Additional space saving results from the conversion of the original, space-wasting cylindrical form to the rectangular shape of the compressed blocks. The total saving in space requirements depends upon the shape and size of the compressed bars and the method of packaging, and may exceed 40 to 46 percent.

Composition and Quality

Dehydration of cheese by the new method increases the concentration of solids about 53 percent. Samples analyzed contain, on the average, 50.5 percent fat, 37 to 38 percent protein and 97.2 percent total solids.

Samples in bar form stored at 105 deg. F. for five months did not show any significant development of off-flavors or other defects. Coating the bars with two layers of cheese wax and packaging in cartons prevents absorption of moisture and leakage of fat. Some oiling-off has been observed in the dried flakes stored at temperatures above 82 deg. F. The final temperature of the dehydration serves as a pasteurizing temperature, and the dryness of the product prevents growth of mold during subsequent storage.

Dr. George P. Sanders, who devised the new method for cheese dehydration, here places trays filled with grated cheese, partially dried at room temperature, into a laboratory dryer for completion of dehydration by controlled circulation of heated air.

The flavor of cheese dehydrated by this process is practically the same as that of the original cheese from which it was made. However, the dried product is crumbly rather than coherent.

Use of Dehydrated Cheese

Cheese dehydrated by the new method is satisfactory for direct consumption, for use in cooking, and for reconstitution into either a cheese that may be sliced readily or into a cheese spread. It may also be used as a base, and mixed with other foods or flavoring materials.

If the dehydrated cheese is to be reconstituted, a smoother product will result if sodium citrate or disodium phosphate is added and mixed in with the flakes. Satisfactory quantities to add are 2 percent sodium citrate, or 3 percent disodium phosphate, by weight of the reconstituted product. Some salt may also be added. To reconstruct the cheese, from 0.67 to 0.75 lb. of water per pound of dehydrated cheese should be added. The mixture should be stirred rapidly while being slowly heated to 160 deg. F. or slightly higher. When it becomes smooth and cohesive, it is poured into glasses and allowed to cool.

A product that is very satisfactory, but not as smooth, can be prepared merely by mixing the required amount of hot water with the cheese and stirring thoroughly.

Making Cheese Spreads

To prepare a cheese spread, a slightly greater proportion of water is used. To prepare a cheese food, with dehydrated cheese as the base, the auxiliary flavoring materials and foods, in rather finely divided form, are added with the water.

The experiments described here were largely confined to the development of the process, and did not include plans for the engineering work necessary for production. Also, long-time keeping quality tests have not been completed. However, the laboratory results so far, as well as the space-saving possibilities, indicate that production on at least a trial, semicommercial basis is warranted.

The Raw Material Problem In Vegetable Dehydration

By H. E. WHEELER, Drying Engineers and Constructors, Chicago, Ill.

There are cases of highly uneconomic practices in the procurement of raw materials. Dehydrators need a definite raw material program to keep costs in line. Size of product, as well as shipping distance and uniform supply, affect operations

EVEN the most experienced dehydrators seem to be temporizing with the problems of raw material supply. As a result, there are cases of highly uneconomic practices that would break an operation in normal times, and may even in these times. I refer to such practices as shipping raw product 1,000 miles or more, buying undersized, immature vegetables, buying unsuitable varieties in poor condition, and so on. These unsound practices came to the writer's attention during a recent trip of inspection to most of the vegetable dehydration plants of California and several in the East.

But what impressed me most is that the so-called normal operation is almost as bad. It is a well-known fact that the cost of preparing small-sized vegetables is several times as great as preparing large ones. Even allowing for the difference in cost, one dehydrator, more alert to this problem than most, estimates that the final total cost of finished product is, in his case, six times as great with small onions as with large. And, in spite of the fact that the fresh market makes no effort to supply large sizes, most dehydrators are still depending on trying to buy at the market rather than under a controlled contract.

For instance, the fresh market wants a cabbage that doesn't weigh much more than 2 lb. or so. The dehydrator would be much better off with one that would weigh 20 lb.! How can he hope to get large cabbage unless it is grown to order, and that doesn't mean just as the grower happens to feel. It means careful control of every step in the growing process, including new field methods not previously used or needed.

I hasten to add that in one or two cases successful dehydrators had competent field men on their own staff giving full time to this subject. In other cases, the field men were not competent, doing no more than signing up the grower and then leaving him on his own to use the same methods he has always used, resulting, quite naturally, in the size and type of product he has always raised.

But, for the most part, this all-important feature of dehydration is receiving about one-tenth the attention it deserves. The best job I saw done was by an independent, or free-lance field representative. This man not only knows the growing side but understands the dehydrators' peculiar requirements, and he has the initiative to develop suitable methods to attain these ends. This man acts as agent for the dehydrator on a commission basis, supplying the form of contract and supervising seed purchases and distribution and the growing period, including harvesting and delivering to the plant at the right time and in sufficient quantities. Where such a man is not available, the dehydrator would do well to train one of his own. First, however, it is preferable to retain some competent consultant to lay out the main features of a program that will suit the plant, location, operation and particular products.

U.S.D.A. Photo by Knell

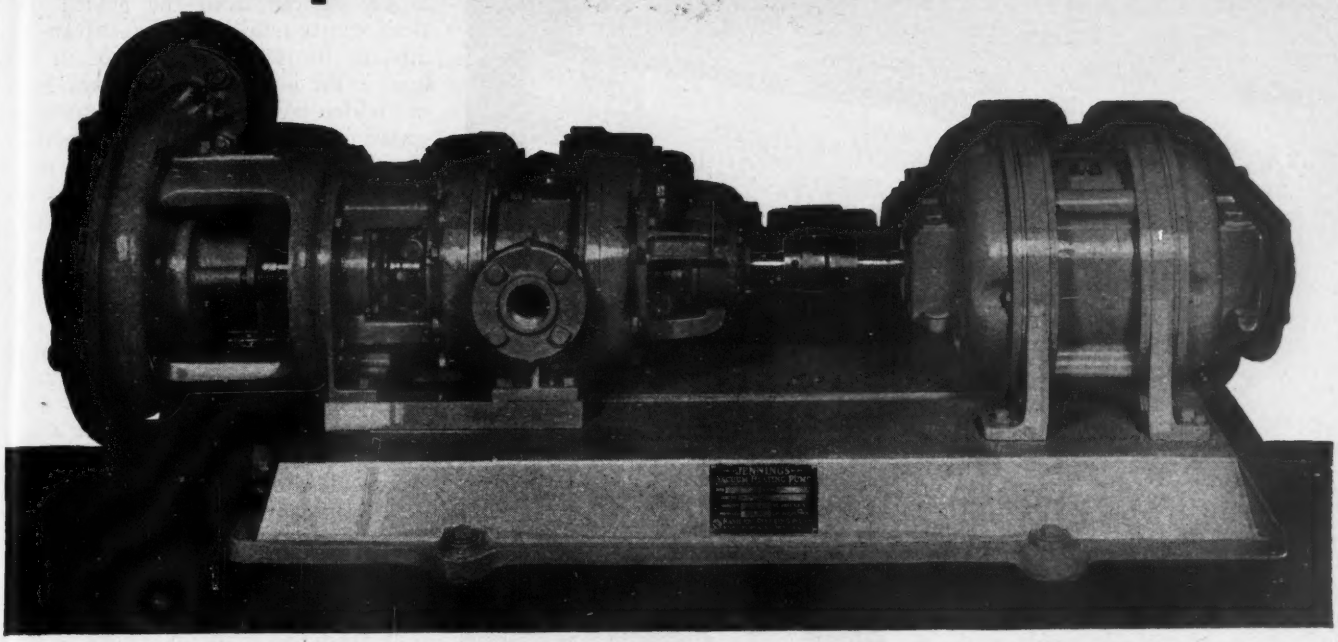
Here's an example of the right type of raw material for producing dehydrated foods—large carrots of uniform size. Because less labor is required for their preparation, large vegetables, sorted as to size, are worth much more to the dehydrator than the same amount of smaller vegetables or of a mixture of large and small vegetables. The two carrots held by the lady weigh 2 lb. and when dehydrated will weigh 3½ oz.

The Best Type of Contract

The form the contract should take in order to protect the buyer, and still be attractive to the seller, is subject to many different approaches. The subject is complicated by the ceiling prices either now in effect or still to come. My own feeling is that the contract should not attempt to tie the grower down to a fixed price, but should provide payment at the market at time of shipment. Any other plan is hard to enforce if the grower chooses to try to break it. Most contracts so far written, however, do provide a fixed price per ton, either in

(Turn to page 110)

Nash—the Perfected Vacuum Pump for Evaporators and Condensers

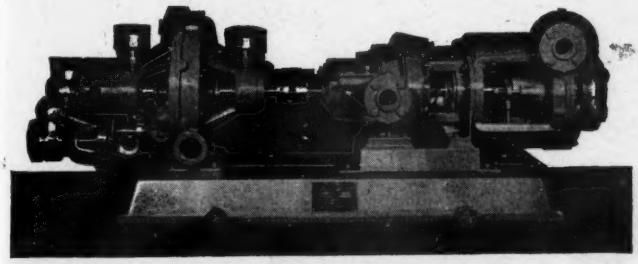


COMBINATION VACUUM REMOVAL UNIT ESPECIALLY DESIGNED FOR SATISFACTORY OPERATION ON CONDENSERS WITHOUT BAROMETRIC LEG

Especially designed for drawing air and liquid from high vacuums, the Nash Vacuum Removal Unit is an efficient combination of a standard Nash Vacuum Pump and a Jennings Centrifugal. This design may be had in either motor or steam turbine drive, and may be installed with confidence that it will operate perfectly.

Nash Vacuum Pumps for Evaporator and Condenser Service offer unusual advantages. Vacuum is non-pulsating, producing uniform operating conditions and assuring a better product. Nash Vacuum Pumps have no valves, gears, pistons, rings, or mechanical complications. The single moving element rotates without metallic contact, and no internal lubrication is required. In standard design these pumps maintain vacuums up to 27" of mercury.

Nash Pumps are compact, and require but a fraction of the space taken by old type equipment. They may be installed where convenient, and they operate at suitable speeds for direct connection to either electric motors or steam turbines. Nash engineers will be glad to recommend proper equipment to exactly meet your particular requirements.



THE NASH VACUUM REMOVAL UNIT MAY BE HAD EQUIPPED WITH STEAM TURBINE DRIVE WHERE THIS TYPE IS PREFERRED

NASH ENGINEERING COMPANY

SOUTH NORWALK · CONNECTICUT, U. S. A.

NEW PACKAGES & PRODUCTS

New Box for "Post-Tens"

GENERAL FOODS CO., INC., is distributing its assortment of "Post-Tens" breakfast cereals in a new package. A single long paperboard carton holds the ten individual servings of cereals, each in its separate box, replacing the panel-container where the individual boxes were packaged with an over-all cellophane wrap. The new container holds the same cereals: Post Toasties, Grape-Nuts, Grape-Nut Flakes, Post's Bran Flakes and the Nabisco Shredded Wheat which is included in the assortment by an arrangement with National Biscuit Co.

Aunt Sarah's Soya Soup

To the growing list of soups packed in envelope containers add "Aunt Sarah's Soya Noodle Soup Mix," made and packed by Traficanti Bros., Chicago, Ill., in laminated heavily waxed paper bags. The 3½-oz. package contains 1½ oz. of noodles made from durum wheat and whole edible soya flour, plus precooked soybeans, wheat flour, salt, sugar, hydrolized plant protein, yeast extract, onion powder and spice extractive. As a soup or as a meat extender, the product is high in energy protein, rich in vitamins and low in fattening starches.

Pillsbury's New Mix

"GOLDEN BAKE MIX," a pancake flour, waffle or muffin mix, recently was introduced in test markets by Pillsbury Flour Mills Co., Minneapolis, Minn. The latest addition to an illustrious line of food products is a mixture of wheat flour, soya grits, rice flour, salt, soda, monocalcium phosphate and powdered skim milk. It is supplemented sufficiently with soybeans and milk to have a high biological protein value. Golden

Bake Mix is packaged in a 1¼-lb. paperboard carton with a printed blue, yellow and red overwrap that has distinct sales appeal.

The trade name "Golden Bake" is largely derived from the golden particles which actually can be seen in the mix, as the soybean is placed in the flour in the form of toasted flakes. Sales of Golden Bake Mix will be limited to certain markets due to the tremendous demands made on the company's manufacturing facilities. However, other markets will be opened as soon as possible.

Improved Envelopes

KEEPING PACE with the development of dehydrated foods, package designers have turned out some excellent containers particularly suited to the qualities of the new products. Typical of the rapid advancement in the field are the heat-sealed cellophane envelopes used for packaging the dehydrated carrot juice cocktail mix and tomato-carrot cocktail mix of P. D. Ridenour Co., Chicago, Ill. These envelopes are of double-wall thickness, with the outside wall lithographed and both ends heat-sealed.

Ridenour's carrot juice mix, which may be served hot or cold, contains dehydrated carrot powder, gum karaya, processed soya and hydrolized plant proteins, and it is mildly seasoned with salt and spices. The tomato-carrot juice mix contains dehydrated tomato and carrot powder, processed soya, hydrolized plant proteins, vegetable gums, salt and spices.

Tootsie-Roll Flavor

SWEETS Co. of America, Inc., Hoboken, N. J., makers of "Tootsie Rolls," has launched its new product, "Tootsie V-M," a vitamin and mineral fortifier

A BOTTLE WILL STOP LIGHT?

Yes THERE'S A DIFFERENCE IN GLASS

TO most people, one of the most noticeable characteristics of glass is the fact that it is transparent—that light passes through it readily.

But the truth is that today's commercial glassware stops many of the rays of ordinary sunlight. You know, perhaps, that the rays that cause sunburn won't pass through ordinary window glass. Nor will they pass through a clear glass container.

However, ordinary colorless glass will not stop all ultra-violet rays. So, to protect certain products from the harmful effects of these invisible rays, some glass containers are colored. Amber glass, for example, is an excellent barrier against the deteriorating effects of ultra-violet light, and you know that almost all pharmaceuticals, as well as many foods and beverages, are packed in amber glass by their manufacturers. They use amber because it is *light-protective*.

The average users of glass packages need not ordinarily worry about what light rays pass through their containers and what do not. But it is important to you to know that some glass stops more light than other glass does—because it proves the point that glass packages that *look* alike may not always *be* alike.

And it's the little things—the little differences in composition, brilliance, clarity, thermal shock resistance and so on that, when added together, make the difference between ordinary glass and top-quality glass.

Armstrong's facilities for producing top-quality glassware, flint or amber, are described in the new booklet, "Men and Glass." For your free copy write Armstrong Cork Co., Glass and Closure Division, 4210 Prince St., Lancaster, Pa.

ARMSTRONG'S GLASS

and **ARMSTRONG'S CLOSURES**

ONE sure way to help keep cash registers ringing up sales for your products is to have your brand name or trade-mark lithographed on Armstrong's Metal Caps.

These colorful closures add eye-catching distinction to today's standardized containers. They make it easy for hurrying housewives to see—and buy—your brand. And the shopper who knows any one of your products is more likely to buy your other items, if you've got your trade-mark on the cap, where it's sure to catch her eye.

Even after your packages are in the home, your lithographed caps continue to build recognition for your whole line. For every time your customers take the caps off your packages, they get fresh impressions of your brand name.

Since you can use the same cap design for all your packages, it actually costs very little to put these "silent salesmen" to work for you. We'll be glad to show you, without obligation, how economically and efficiently it can be done.

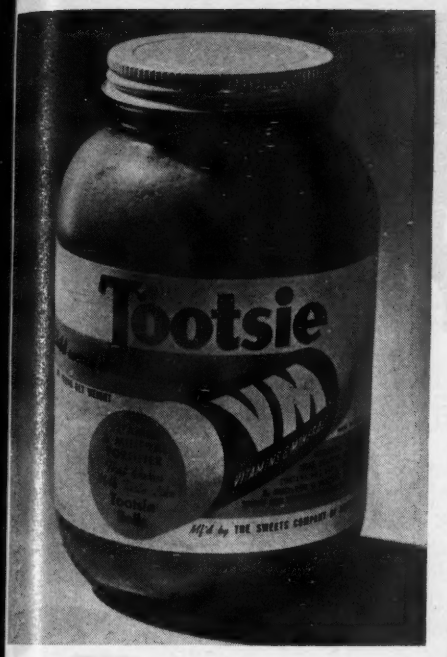
Just send us your present container, with a description of your trade-mark or brand name.

And we'll be glad to put our years of experience, and our laboratory and design facilities, to work on any other wartime glass packaging problems you may have. Write Armstrong Cork Co., Glass and Closure Div., 4210 Prince St., Lancaster, Pa.

The Army-Navy "E" and Star have been awarded to the men and women of Armstrong's Closure and Floor Division Plants for excellence in the production of such war materials as cartridge cases, shells, bombs, and camouflage netting.

ARMSTRONG'S CLOSURES

Turn standard containers into standout packages

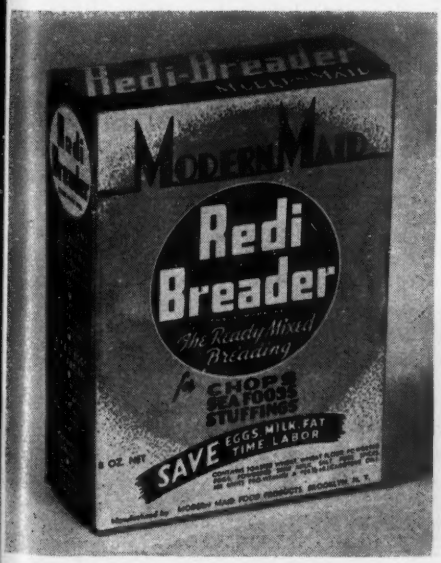


which makes milk taste like Tootsie Rolls. One of the best known and most sought-after flavors, the distinctive Tootsie Roll taste automatically presold the milk fortifier to its primary market, children. Women buy this type of product as an inducement to their children to drink enough milk.

In addition to the taste advantage, Tootsie V-M is liberally enriched with vitamins A, B_1, B_2 and D and minerals —iron, calcium and phosphorous. The benefits offered by the milk, sugar, malt and dextrose ingredients make the new product an excellent diet supplement. As production is still limited, sales of Tootsie V-M are at present confined to New England and New York State, scoring marked success in these areas.

Saves Milk, Eggs

WHILE prepared breading mixtures are not an innovation, "Modern Maid Redi-Breader" manufactured by Modern Maid Food Products, Brooklyn, N. Y., deserves mention for its timely appearance when milk, eggs and fat are so hard come by. Redi-Breader is not a byproduct of bread crumbs or cracker meal but a fully prepared mixture containing heat-treated wheat flour, eggs, milk, provitamin A, salt and spices. It does not spoil and there is no waste. The product is packaged for consumer and for bulk sales.



B_1 Cola Beverage

WAR-PLANT workers in the aircraft, shipbuilding, tank and locomotive industries, among others, have indorsed the new cola beverage, "Nutri-Cola," manufactured by Nutri-Cola Co., Inc., Long Island City, N. Y. With the needs of war workers particularly in mind, the company added sufficient vitamin B_1 to Nutri-Cola to enable the body to convert sugar to energy without drawing on the supply of B_1 in the daily diet of the average person. The refreshing energy-builder is said to provide one-third of the minimum adult daily requirement of the vitamin.

High Protein Value

HIGH NUTRITIONAL VALUE—protein, vitamin and mineral—and a new flavor are offered in "Vivasoy," specially processed from soybeans by Commander Larabee Milling Co., Minneapolis, Minn. Through a special manufacturing process the fatty oils of the soybean have been removed, which will overcome the former objection on the part of consumers to full-fat soybean products. Manufactured in flour form, the product can be used in meat loaf, bread baking, meat patties, soups and other foods.

LOOKING AHEAD...

No merchandiser is fooled by the ease with which his product sells nowadays. Abnormal conditions are always temporary. That tough Buyer's Market may be just around the corner.

Buying habits are being formed today as always. Mrs. Consumer, whether consciously or unconsciously, continues to make a bee-line for Quality—and Quality is unmistakably typified by a distinctive, appetite-whetting package.

The Rossotti organization offers you a completely integrated service on fine Labels, Package Wraps and Folding Cartons—from sketch to finished product. Complete Art, Idea, and Merchandising Counsel.

Why not call in a Rossotti Packaging Man for a constructive discussion of your individual requirements? Or drop us a line at our North Bergen Plant. No obligation at any time.

ROSSOTTI LITHOGRAPHING COMPANY, INC.
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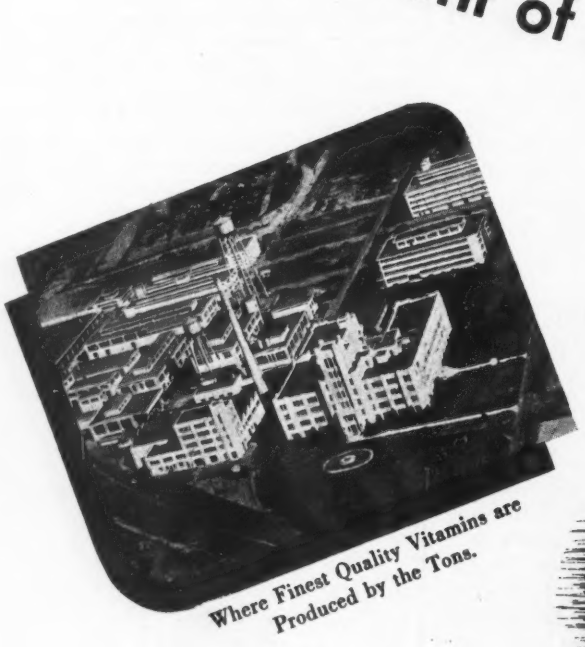
as inevitable as the coming of the dawn

. . . enrichment of more processed foods



Where Finest Quality Vitamins are Produced by the Tons.

Consult one of the world's largest makers of vitamins—Hoffmann-La Roche, Inc., Roche Park, Nutley 10, N. J. Address: Vitamin Division.

ROCHE

Materials Made Available For More Food Equipment

WPB sets quotas which in some cases exceed the amounts used in the base period of 1939-41.

FOOD MACHINERY manufacturers are on the spot. The present situation demands that they take prompt action to secure the additional quantities of materials that have been made available through the quota schedules recently issued under Order L-292, which covers the manufacture of food processing equipment. Failure to do so will mean the loss of additional business, its profits and good will, and may also jeopardize the position of the entire food industry in making future requests for material before the Requirements Committee of the War Production Board.

For some months the War Food Administration has been working on a long range plan by which the requirements of the food industry for new equipment could be met. These requirements were carefully worked out in conjunction with various industry groups and enabled the War Food Administration as a claimant agency for the food industry to go before the Requirements Committee and secure an allocation of metal which would permit increased production of food machinery. It is the first recognition of the importance of food processing equipment to be made by the Army, Navy and other claimant agencies.

The program follows the pattern laid down by the War Production Board order L-292, but prohibits the manufacture of food processing machinery in excess of 50 percent of the average amount fabricated during the three-year base period 1939–1941, inclusive, unless the order is amended by a quota schedule permitting a higher rate of production. Schedules for each branch of the industry were ready by mid-September and publication was expected prior to October 1, when the program goes into effect.

The first schedule, issued early in September, established quantities for 50 specified types of dairy processing machinery that may be produced by each manufacturer during the fiscal year beginning October 1. The quota ranged from 40 percent for homogenizers to 1,275 percent for cheese pasteurizers. In general the quotas were set at approximately 100 to 120 percent of the average for the base period. Demands for cheese, powdered milk and other products resulted in higher percentages —350 percent for spray milk and egg dehydraters and 650 percent for roll milk dehydraters of various sizes.

There is nothing in the order that freezes the manufacturer's production schedule once the schedule has been established, as is the case in many other lines of equipment manufacturing. The War Production Board reserves the right to increase or decrease any quota that may be established and "may transfer any portion of a quota of the manufacturers, taking into consideration the amount of materials to be used, the need for particular items at the time required, the labor and transportation situation in the manufacturing areas involved, the inability of any manufacturer to manufacture his quota, and also other factors as may be revealed."

It is assumed that the equipment manufacturer would establish production schedules for his shops that would take into consideration seasonal requirements as well as total requirements. The equipment for the pea canners will have to be produced before the equipment used by sweet corn packers. For items where the sky is the limit on production, it may be impossible for the manufacturers to meet the production quotas even though they operate their facilities to capacity for the entire year.

WFA officials have pointed out that any delay in the publication of schedules amending Order L-292 should not prevent the manufacturers from making immediate request for material for 50 percent of their quota that is permitted by the order. "It is important that manufacturers immediately review their requests for materials and submit supplemental requests on CMP-4B's wherever needed to fit into these new programs. The Controlled Materials Plan has so closely tailored allotments of materials to the available supply that further delay on the part of manufacturers in placing their requests will make it difficult for them to obtain materials within the quarter needed." This is a reminder that full advantage should be taken of the forward buying permitted

Pix

THEY HAVE GONE BACK TO SCHOOL

When school opened last month the problem of manpower for the food and other industries became even more acute than it was during the summer months, except for seasonal packers who had completed most of their run. Thousands of high school and college girls and boys who helped the war effort by working during their vacations had to quit their jobs. Above are two workers of this type, packing sugar in a West Coast plant. To ease the shock of losing the young help, War Manpower Commissioner McNutt gave official approval to a program adopted in many communities permitting school-age workers to work part time while getting their education.

under the Controlled Materials Plan.

Food processors can assist by placing orders for their requirements as early as possible to give the equipment manufacturers the assurance of a backlog of orders.

In Washington it is felt that the new program offers important advantages to the industry and to the officials charged with the administration of the order. The shelf stock that will be built up will provide for emergencies, the machinery manufacturer can fabricate in quantities that can be most efficiently handled, and the flexibility of the program enables the administrators to change quota percentages as may be necessary.

Most important, food processors will have more equipment. Schedules for industries other than the dairy industry expressed in terms of percentage of the average production for the three-year base period are approximately:

Bakery	94%	Sugar	67%
Canning	116%	Oil extraction	93%
Cereal	75%	Fishery processing	117%

The picture is much better than these approximations indicate. For instance, quotas established for the canning industry take into consideration limitations imposed by orders controlling tin cans, glass containers and closures which regulate what may be packed, how much may be packed, and what size container may be used.

There will be more equipment available under the WFA program for processors of sweet corn, peas, snap beans and tomatoes which are without quantity restrictions than for processors of foods deemed unimportant in the present emergency.

Army Rations Double As Civilian Food

EMERGENCY rations developed by the Quartermaster Corps for the armed services may see double duty as temporary food for civilians in liberated nations. Victorious Allied armies entering places formerly occupied by the enemy often find civilian populations reduced to near starvation because of enemy seizure of crops and other foodstuffs. To meet the situation the Quartermaster Corps has discovered that the Army's "C" and "K" emergency rations can be used in ordinary form for adult feeding and can be broken down into various components for children. "Toning down" the rations for child feeding was necessary to reduce the high-caloried items to the point that they could be fed to babies without harm. Feeding liberated civilians by this method is not designed as a permanent program but simply as a measure of expediency in time of need.

Jones Opens Food Campaign

"Food Fights For Freedom" educational program will hit peak in November

"AN ADEQUATE amount of wholesome food for American civilians for the duration" was the pledge made by War Food Administrator Marvin Jones at the OWI-War Advertising Council joint meeting in New York on August 26. Firing the opening gun in the "Food Fights for Freedom" campaign to make the nation aware that food is a vital weapon of war, Marvin Jones introduced the highly coordinated overall program to a group of New York advertising men, editors and food field representatives.

Discounting rumors of vast shortages, Jones assured the group that the American farmer was fully prepared to produce enough food to feed the United States and our allies, if he was given complete facts on our food needs. For the last five years the American farmer has broken all world production records, and was prepared for the war when it came by a long program of soil conservation and building up of reserves. This year more livestock and greater planting than ever before are on the books, although the distribution problem will become increasingly difficult with the problem of supply to soldiers and civilians of liberated nations.

As part of the meeting other government spokesmen — including Chester Bowles, general manager of OPA, Vernon Beatty, advertising director for WFA and Charles G. Mortimer, coordinator of food campaigns for the Council—urged business leaders to put the power of their advertising behind the Food Fights for Freedom educational program. The campaign calls for mobilization of the production and distribution branches of the food field in a drive that will achieve a peak in November and continue thereafter. It is destined to make more effective such essential wartime programs as nutrition, conservation, Victory gardens, rationing and farm production goals.

For the official emblem of the "Food Fights for Freedom" campaign, see the cover of this issue of FOOD INDUSTRIES.

Ice Cream Makers Ask Aid in Shortages

TAKING the initiative in meeting the current acute dairy industry problems, the International Association of Ice Cream Manufacturers has appealed for cooperation of the industry in meeting butterfat shortages. Committees of the Association have called for voluntary action of ice cream manufacturers to decrease any extra holdings or customary heavy seasonal inventories of butterfat and solids. The industry was asked to reduce its use of fresh supplies by using present inventories during the next few months, when the butterfat situation will probably be most critical.

Canadian Army Photo

CANADA DEVELOPS EMERGENCY RATION

So that they may have food in event their supply column gets lost, their ship is sunk or their airplane comes down in an isolated place, the soldiers, sailors and aviators in the Canadian armed forces are equipped with emergency rations. The picture shows the various items in the Army ration. They include canned beef and pork, sardines, jam and butter, tea, sugar, special biscuits, cheese, pea soup powder, dried milk and sugar mixture, chocolate drink powder, soluble coffee, chocolate, hard candy and chewing gum, salt, ascorbic acid, cigarettes and matches and a can opener.

Leaders Juggle Subsidy Rollback

General support price program becomes a political football of food groups

WHILE leaders of the country's three big farm organizations were in conference at the White House, being assured that no general subsidy rollback was planned, a $100,000,000 subsidy price rollback program was announced by Chester Bowles, general manager of OPA. The Bowles statement, following up a directive from Economic Stabilizer Vinson to roll back prices on seven major fruits and vegetables, was said to have been prepared by OPA economists and came as a surprise to price executives. According to reliable information, the statement contains decisions exactly the reverse of those planned by OPA price executives some weeks ago.

Although the main issue of the large-scale consumer subsidy program was still veiled in confusion, several loan programs on individual farm products were announced in September. Support prices were announced for butcher hogs. A loan program was issued for Irish potatoes to insure growers of returns in accordance with the support prices announced prior to planting time and to assure the orderly distribution of this year's record crop. WFA announced a program designed to assist Louisiana sugarcane growers in maintaining production at a high level.

Single Control Agency Demanded for Food

"AN IMMEDIATE program of increased production and improved distribution must be adopted by a single agency clothed with full power over food in all of its aspects. Otherwise, we shall not only be without the means of relieving the starving people of Europe and Asia, but there will be the most serious shortage and hardships in the United States itself." This is the pertinent section of the Republican declaration formulated at Mackinac Island.

Comments from the food industries indicate general approval of the principles. There is some evidence in Washington that this pressure from the opposition may somewhat increase the authority and the centralized control over food under Marvin Jones, Food Administrator. Certainly this item is going to be an important part of the 1944 political campaign unless very effective steps are taken meantime by the Administration. But it is not expected that food companies will wish to take any part in the partisan controversy.

In WAR... as in PEACE

—our wrapping machines are proving that they have the VERSATILITY, SPEED and STAMINA to meet unusal demands

Supplies that are pouring from our wrapping machines, in plants throughout the country, are as vital to the armed forces as the guns that will shatter the Axis . . . Rations, carbine clips, drugs, bandages, biscuits, surgical silk are among the diversified products being wrapped on these machines.

In a great majority of cases the same machines that handled peace-time goods are being used – which proves the value of wrapping machines that are *versatile.* Without this versatility, many a manufacturer who cannot obtain new machines would be forced to employ slow, time-consuming hand methods.

Working 24 hours a day, week after week, our machines are likewise proving that they have the stamina to stand up under heavy production demands. Sound design, and engineering that results in smooth, vibrationless action make this possible—and, of course, long-wearing parts play an equally important role.

If you require additional wrapping machines for war or essential civilian supplies, we will be glad to give you a delivery date and helpful information on securing priorities.

We are also ready to study your post-war requirements

This timely booklet tells what you can do to extend the life of your wrapping machines. We will gladly send you as many copies as you can use to advantage.

PACKAGE MACHINERY COMPANY, Springfield 7, Massachusetts

NEW YORK CHICAGO CLEVELAND LOS ANGELES TORONTO

PACKAGE MACHINERY COMPANY

Over a Quarter Billion Packages per day are wrapped on our Machines

Food Administration Orders

Cream—WFA has amended FDO 13 to cover all sellers of cream, including producer-distributors delivering less than 1 gal. of cream a day, who were exempt from the provisions of the original order. The amendment also extended the present restrictions on the sale of cream containing more than 19 percent butterfat, restricted the sale of cream or any cream product to which evaporated, condensed, dry whole, or dry skim milk has been added, and made a detailed definition of cream in the order.

Concord Grapes—On September 13 WFA acted to restrict the sale of Concord-type grapes for fresh consumption in five heavy commercial producing regions to assure the availability of supplies of processed grapes for the manufacture of increased quantities of jams, jellies and fruit butters. FDO 80 designates the restricted areas as certain counties in New York, Pennsylvania, Ohio, Michigan and Washington.

Oil of Peppermint—WFA has acted to assure an equitable distribution of oil of peppermint—an essential oil important in food preparations—by reserving all such oil for government action. Under FDO 81, effective September 13, all persons now owning, controlling or having in their possession in excess of 25 lb. of oil of peppermint must set aside for government action 100 percent of their holdings.

Dried Raisins, Prunes—West Coast packers have been authorized to release from 120,000 to 130,000 tons of dried raisins and prunes from their 1943 production for sale to civilians through the regular commercial trade channels. Additional quantities will be released later. The supplies will come from the raisins and prunes which packers were required to set aside for government use under FDO 16, according to the announcement on September 10.

Raisin-Variety Grapes—In an amendment to FDO 17 released August 31, WFA directed that California raisin-variety grapes must be sun-dried rather than dehydrated by the use of artificial heat, in order to free dehydration facilities for use in processing those grapes which cannot be sun-dried.

Fish Supply—Approximately 65 percent of the overall food fish supply will be available to civilians during the 12-month period ending June 30, 1944. This will provide a per capita quantity of 7.9 lb., or approximately 1.3 lb. less than last year, according to WFA announcement on September 11.

Beef Shipments—As a result of the action taken September 10 in amendment 2 to FDO 75.2, shipments of beef to American soldiers overseas should be speeded materially. Of the beef that all Class 1 slaughterers must set aside for government use, 80 percent must now be in the form of frozen boneless beef.

Turkey Embargo Order—WFA recently moved to stop all further sales of turkeys to civilians after August 21 and until the armed forces' request for 10,000,000 lb. of turkeys for overseas shipment is met. The restriction was issued as an amendment to FDO 71.

Canadian Salt Fish—To simplify import operations, WFA on September 3 exempted salt fish importers from submitting copies of contracts in advance for imports from Canada. This action, contained in an amendment to FDO 72, continues the requirement, however, that advance contracts be made and copies submitted with respect to supplies obtained from Newfoundland or Iceland.

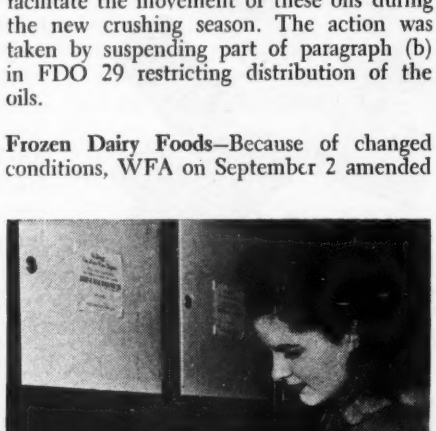
Butter Set-Aside Quotas—WFA announced on September 1 that the quantity of butter which producers must set aside for government purchase was reduced from 30 to 20 percent for September production and that the previously announced 30 percent set-aside quota for October was eliminated. The lowered percentage, contained in amendment 2 to FDO 2.2, should provide sufficient additional butter to meet government requirements during the fall and winter.

Crude Vegetable Oils—WFA has suspended restrictions of delivery of crude cottonseed, peanut, soybean and corn oils to refiners for the calendar quarter beginning October 1 to facilitate the movement of these oils during the new crushing season. The action was taken by suspending part of paragraph (b) in FDO 29 restricting distribution of the oils.

Frozen Dairy Foods—Because of changed conditions, WFA on September 2 amended FDO 8, covering ice cream and other frozen dairy foods. Processors are now permitted to use milk solids in the production of frozen dairy foods and mix for delivery to the Veterans Administration, "contract" schools and eligible ship operators as defined in Food Regulation 2.

Tea—On September 2 WFA announced that quotas for tea packers and wholesale receivers will be increased one-fifth for the current and subsequent quarters. Improved shipping conditions have resulted in more tea being imported into this country to date than had been anticipated under the present purchase plan. The amended FDO 18.3 increases quotas for tea packers and wholesale receivers from a quarterly quota of 50 percent to one of 60 percent.

Peanuts—WFA on September 1 announced that peanuts will be available in the same quantities as in the calendar year 1942 for the making of edible peanut products, and for salting, frying and roasting. Allocation of the anticipated supply also will provide sufficient peanuts for substantial increases in the production of peanut butter and peanut oil to meet war requirements. These allocations are provided in FDO 78, which became effective September 1.



Courtesy Du Pont Co.

ONE OF 4,600

Recent government surveys reveal that there are 4,600 locker plants located in 46 states, handling about half a billion pounds of meat, poultry, fruits and vegetables a year. Most of these plants are in the Midwest and Pacific Northwest. Of the million families served, about three-fourths are farmers. In addition to the locker freezers, there are nearly 60,000 home freezer units in use.

Meat Council Predicts Serious Shortages

HUGE LOSSES of meat and serious shortages of beef for American fighting forces and civilian consumers this coming winter and spring are developing, according to The Livestock and Meat Council, which has just completed a study of the situation.

Calling for a unified system of meat management, the Council reported that: "Thirty percent fewer feeder cattle and calves were shipped in the eight corn belt states than during July a year ago. Feeder cattle passing through the yards of the four largest livestock markets in the corn belt during the two weeks ending August 13 were 47 percent fewer than during the corresponding two weeks of 1942. There is reason to believe that of the sharply reduced numbers of animals classified as feeders many actually did not go to feed lots but rather to black market operators. . . . Only 14 percent of the cattle on feed August 1 are expected to be marketed in December or later, and the Department of Agriculture concludes that this points to a very short supply of long-fed cattle during the later months of the year."

Citric Acid Obtainable

ALTHOUGH no additional citric acid will be released to the food industry this year, an amount equal to that of last year is still available. At a meeting of the Flavoring and Extracts Industry Advisory Committee in Septem-

AIDS FOOD CAMPAIGN

J. Sidney Johnson, manager of the merchandising division of National Biscuit Co.'s general sales department in New York, has been appointed to handle the trade contacts in the Food Fights for Freedom campaign being conducted by the WFA in cooperation with the War Advertising Council. Mr. Johnson will work with Vernon D. Beatty, director of Advertising for WFA.

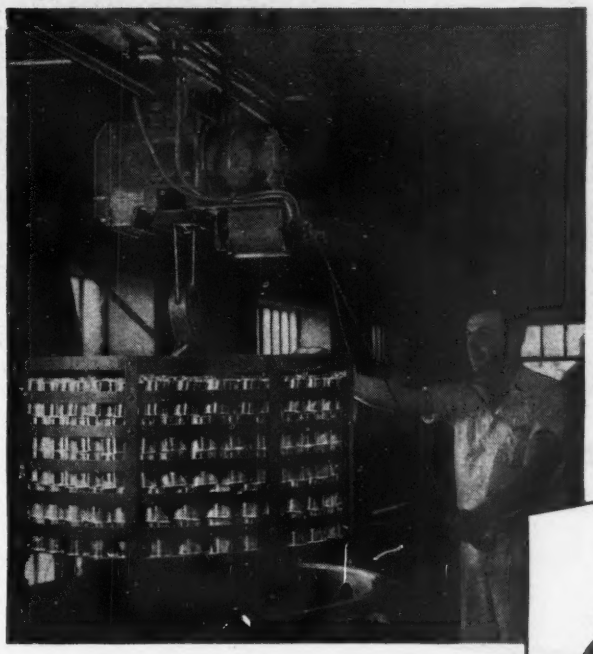
ber, WFA officials explained that no extra allotments of citric acid were forthcoming because of increased war demands and shortage of molasses, but that it would be possible to obtain substitute acids as well as limited supplies of lemon oil.

Lend-Lease Food Shipments Increase

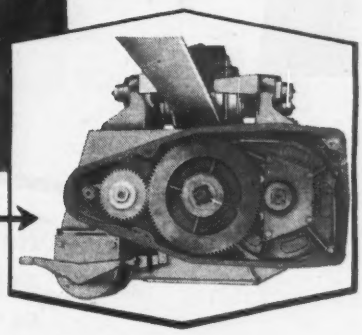
INCREASING shipments of food to Allied fronts are making heavy demands on United States processors, with no let up seen for the winter months. Early in September the War Food Administration reported that it had delivered about 1¼ billion pounds of food and other agricultural commodities to shipside during July for export to allied fighting fronts. Deliveries totaled 6¼ billion pounds during the first seven months of 1943. For the year as a whole it is expected that about 10 percent of our total food supply will be sent abroad under Lend-Lease. Last year we provided our allies with about six percent of our supply.

A smaller proportion of the food produced in the United States will be available to civilians in the next ten months than at any time since Pearl Harbor, with civilians tentatively allocated 75 percent of the supply. The armed forces will receive 13 percent, Lend-Lease recipients 10 percent and "special needs," 2 percent.

Speed WARTIME Food Output WITH R & M ELECTRIC HOISTS!



Here's what Rex W. Perry, president of the Perry Food Products Co., says about this R & M Hoist. "With an absolute minimum in maintenance, our R & M Hoist has always performed perfectly. It is an indispensable aid in speeding production of food for our country and allies."



JUST REMOVE THE COVER and the entire hoisting mechanism may be quickly withdrawn! Note the extreme simplicity and precision engineering. Compactness provides utmost headroom and increases lift.

Up-to-the-minute food plants everywhere—of which the Perry Food Products Co. is a typical example—are *increasing* their production of vital foods for home and abroad with R & M Electric Hoists. Why not enlist their capable help to speed *your* lifting and conveying operations?

They give "airline speed" to production lines because they are fast and efficient. Because they handle loads from any angle with perfect balance. Because they're *engineered* to deliver trouble-free, 24-hour service, year in and year out. Because they guarantee the utmost in utility, power and safety—yet require a minimum in overhead space.

Whether you require capacities of 1,000 or 15,000 lbs., there's an R & M Electric Hoist *tailor-made* for the job; and it can be equipped with special trolleys to fit any type of monorail. Where greater distances of movement and high-speed transportation are essential, investigate R & M's complete line of Motor-Driven Trolleys.

The following R & M Food Hoist distributors, or your nearest R & M sales and service office, will be glad to furnish complete details. Or write for factual Bulletins 6161A and 7171A.

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A. K. Robins & Co.....Baltimore
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Dunkley Co.....Kalamazoo, Mich.
Chisholm-Ryder Co.....Niagara Falls
James Q. Leavitt Co.....Ogden, Utah
Robert W. Taylor Co.....San Francisco, Cal.
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Send us your inquiries and furnish full details or specifications and we shall be glad to give you immediate attention.

Edge Moor fabricates process equipment of all types and sizes of the following metals:

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Chemists Report New Findings

Papers at food section of the ACS meeting discuss several recent discoveries

NEW FACTS about food technology were presented and new methods described at the convention of the Division of Agricultural and Food Chemistry of the American Chemical Society in Pittsburgh, September 6–10.

A new method for the manufacture of wheat starch was explained in a paper by Richard L. Slotter and Cecil T. Langford, Northern Regional Research Laboratory, Peoria, Ill. This process is analagous to that used in the wet milling of corn. The whole grain is steeped in a weak solution of sulphur dioxide at a temperature of 100 deg. F. for 20 to 24 hours. Then the grain is ground, screened and separated into starch and byproducts. Operating costs are said to be slightly lower than for the wet milling of corn, and the starch obtained is of good quality.

M. E. Parker, production manager of Beatrice Creamery Co., Chicago, reported the development of a new method which gives promise of considerable revision in the processing of cream for buttermaking. By utilizing certain conventional equipment, an intermittent operation is made ready for immediate application, and this is expected after the war to evolve into one of many continuous processes of buttermaking, all of which will serve to usher in a new dairy science.

The production of a food concentrate from distillery residues was described in a paper by Norman R. Joseph, Arthur Novak and James K. Woods, of Joseph E. Seagram & Sons, Inc., Louisville, Ky. Ammonia and phosphoric acid are added to the waste material and yeast is cultivated on the mixture. The process converts approximately 90 percent of the ammonia to yeast proteins.

Preliminary studies on the stabilization of thiamine in dehydrated foods were reported by E. E. Rice, H. W. Schultz and H. E. Robinson, Swift & Co., Chicago. Although the thiamine in dehydrated pork is reasonably stable below 100 deg. F., destruction is accelerated at higher temperatures. In a commercial dehydrated food made principally from approximately two parts of fresh meats and one part of mixed cereals the thiamine is well retained. When the nonmeat ingredients of this product were mixed with dehydrated pork, the thiamine became definitely more stable. Storing of dehydrated pork in vacuum, carbon dioxide or nitrogen produced somewhat greater destruction than did storage in air, and removal of

fat was only slightly beneficial. Several antioxidants were found to be ineffective, as were dried milk, glucose, sodium, chloride and sodium nitrite.

The retention of vitamin A during storage of spray dried eggs was the subject of a paper by Harry L. Fevold and Howard D. Lightbody, Western Regional Research Laboratory, Albany, Calif. The vitamins in eggs are stable during the drying process, but during subsequent storage some loss of thiamine occurs and vitamin A is lost fairly rapidly.

Discussing the suitability of some plant proteins for replacement of animal proteins in the wartime food economy, D. Breese Jones, Agricultural Research Administration, said that the addition of 5, 10 and 15 percent of soybean flour to patent flour increased the growth promoting value of the latter 2-, 4- and 5-fold, respectively. Peanut and cottonseed flours gave supplemental values of 1.4, 2.2 and 2.3 times that of patent flour when the total protein content of the diets was restricted to 9 percent.

Ration Developed for Invasion Operations

KNOWN as the "10-in-1" ration, a new packaged ration containing a day's complete food supplies for ten men has been turned out by the Quartermaster Corps. Intended primarily for use by details of soldiers in the theatre of operations where field kitchens cannot operate, in isolated outposts, or in highly mobile operations, the ration is largely a component of existing smaller field rations ingeniously packed to facilitate handling and transportation. Components include previously tested and approved ration items already supplied in the "K" ration and the "5-in-1" ration now widely used in jungle warfare, the Logan chocolate bar, Carter's spread, the Army's canned nonmelting butter and other packaged items of Army subsistence.

Argentina Adopts New Agricultural Policy

EXPANSION in crop and livestock production is the keynote of the new agricultural policy of the Argentine government. The new policy is based on these fundamental principles—increasing production, eliminating all the restrictive measures of previous years and protecting the producers' economy and improving his position in national life. It appears that the Argentine government has abandoned its decade-old policy of restricting farm and ranch production through control measures of various kinds.

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REFRIGERATION *makes it mighty!*

FOOD . . . . preserved, processed, stored in all its body-building, health-giving, vitamin-packed effectiveness, by MECHANICAL REFRIGERATION, is a mighty weapon on the home front, and on the reoccupation fronts.

Maintaining the continued efficiency of your present Refrigeration, supplying essential new Refrigeration capacity and equipment, are some of the extra tasks of the Vilter Organization. Call on us when we can help YOU to more efficient service on the food front.

Progress in Refrigeration Starts at Vilter

Vilter's contribution to every phase of modern Refrigeration is the result of three quarters of a century specializing in "doing one thing well". Today's success of Vilter installations in all industries are evidence of this knowledge and advanced engineering . . . . Promise of greater things in Refrigeration tomorrow.

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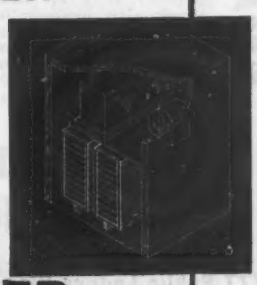

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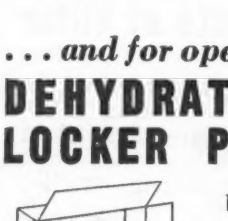

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OPA Price Regulations

Turkeys—Prices for dressed, drawn and quick-frozen eviscerated turkeys sold to the Army during the months of August and September were set on August 23 by OPA, in Amendment 13 to RMPR 269. At present no sales of turkeys may be made to civilians, to assure Thanksgiving dinners for the armed services.

Frozen Fruits, Berries and Vegetables—Packers selling frozen commodities of which there are two seasonal packs—for instance the spring and fall packs of spinach—may figure maximum prices separately for each pack, OPA announced in amendment 4 to MPR 409 issued August 28. The clarification was necessary because the regulation requires that raw material adjustments on frozen commodities sold under its provisions be based in each case on not less than the first 75 percent of 1943 raw material purchases.

Frozen Peeled Shrimp—Maximum prices for processors of frozen peeled shrimp both veined and unveined, were established on August 31 at levels which will represent an average reduction of from 10 to 15 percent to the consumer and which are in line with maximum prices already established for other items of frozen shrimp. The maximum prices were listed in amendment 4 to MPR 364, effective September 4.

Potatoes and Onions—A method by which retailers who buy ungraded and unsacked white potatoes and dry onions at a country shipping point, and then grade and sack them, must establish their maximum prices for these potatoes and onions was announced on September 11 by OPA. In applying the fixed mark-ups provided by the overall mark-up regulations, retailers must, in such cases, use as their "net cost" price fixed in RMPR 271. The action was taken through amendment 4 to MPR 423.

Processed Beans, Macaroni—An amendment requiring processors, primary distributors and wagon wholesalers of processed beans, macaroni and noodle products to give wholesalers and retailers formal notification of allowed increases in their maximum selling prices was issued on September 14 by OPA. The step was taken through amendment 1 to MPR 427 because the fixed mark-up regulations governing wholesalers and retailers require formal notification of any increases allowed by OPA before they can recalculate their own maximums.

Dried Prunes, Raisins—Maximum prices for the 1943 crop of dried prunes and raisins, expressed in dollars per ton, were established on August 28 by OPA at the level of the support prices announced some time ago by WFA. The action, taken through MPR 461, represents an increase of 40 percent over 1942 maximum prices in the case of raisins and 35 percent in the case of prunes.

Cider Vinegar—The regulation under which sellers of cider vinegar other than wholesalers and retailers establish their maximum prices was amended on September 2 to include a provision for formal notification to wholesalers and retailers of any price increases allowed to their suppliers under the regulation. The amendment to MPR 428 was necessary because, under fixed mark-up regulations, wholesalers and retailers can recalculate their maximum prices only when notification of such allowed increases is provided by processors or other suppliers.

Shell Eggs—Maximum prices for wholesale grades of shell eggs, introduced previously into the regulation controlling prices of eggs and egg products was made permanent in amendment 13 to MPR 333 effective August 30. Specifically the maximum prices for wholesale grades and current receipt eggs are being extended through the week beginning October 25, 1943, on the seasonal adjusted basis of pricing in MPR 333. The prices are in line with those already established.

Sugar for Canning—Sugar for canning sweet potatoes was made available on August 30 in amendment 35 to Rationing Order 3. Until recently, canning of this product was prohibited by WPB to conserve limited supplies of tin for canning only the most essential foods. However, a recent change in the tin allocation order now permits sweet potatoes to be canned, and OPA accordingly has made the necessary sugar available for this purpose.

Paper Bags, Envelopes—All manufacturers were held to 1941 selling levels on current sales of specialty paper bags and envelopes or services connected with such sales in a new regulation, MPR 463, effective September 8. The designation includes such items as certain automatic and flat-style paper bags and envelopes made from specialty papers, used largely for the protection of food products such as coffee, potato chips, noodles and cereals.

Prepared Flour Mixes—Allowance for increased costs of ingredients and packaging materials for pancake flour mix and waffle flour mix was made on September 3 in MPR 462, setting a method for processors and specified distributors of these prepared flour mixes to adjust their maximum prices. The extent of increases permitted by the action will vary from seller to seller, inasmuch as each producer calculates his own cost increases that have taken place between the base period and the effective date, September 8, 1943. The base period is June 1, 1941 through August 31, 1941.

Sausage Prices—The labeling requirements of the regulation controlling sausage prices at wholesale were revised on August 27 so that the labels will describe more fully to the public the ingredients in the various sausage items offered for sale. Amendment 7 to MPR 389 also establishes dollars-and-cents ceiling prices for several types of sausage not previously covered by the regulation, among them kosher sausage, effective August 27.

Frozen Eggs—A mark-up of one-half cent a pound over established maximum prices for frozen eggs when these are sold, usually to

bakers and confectioners, in small containers of 20 lb. or less was authorized on September 9. Amendment 14 to MPR 333 also revises the applicability of other small-scale differentials previously established in the regulation.

Processed Meats—The retail price regulation covering processed meats was amended on September 8 to bring it into line with recent changes in the wholesale sausage regulation. In amendment 8 to MPR 336, two principal changes were made to the regulation. One revised the labeling requirements for sausage items; the other established specific, cents-per-pound maximum prices for several types of sausage not yet given prices.

Live Hogs—The first ceiling placed upon livestock by OPA, concurred in by WFA, was issued September 11 in MPR 469. Live hogs, which contribute more to the farm income of the United States than any other meat animal and also produce the heaviest meat tonnage, were placed under dollars-and-cents ceilings for sales within the United States. A ceiling of $14.75 a hundredweight in Chicago is the key price in the new regulation.

Tomato Juice—Canners in California were authorized on September 6 to sell and deliver tomato juice of the 1943 pack to government procurement agencies under an agreement with the buyer in each case to adjust the selling price to conform with maximum prices to be established by OPA. The action was taken in Order No. 4 under MPR 306 because of known plans for revision by the Commodity Credit Corp. of its purchase and resale program for tomatoes in California.

Canned Fish—To protect existing ceilings on canned fish, OPA on August 23 amended its fresh fish and seafood regulation to provide that the maximum at which any seller can sell to a cannery is that established ex-vessel—the fisherman's maximum. In addition, amendment 4 to MPR 418 also deals with sales to wholesalers who operate retail counters, sets forth a new invoice provision and issues ceiling prices for some new items not previously listed.

Sirups—Packers of Georgia cane sirup blends which contain over 5 percent sugar sirup or additional ingredients besides corn and cane sirup may apply for adjustment of their maximum prices if these prices are below those set by GMPR. Amendment 6 to MPR 291, effective August 30, provides for adjustment of such blends if ceiling prices as determined by the specific method set out in the regulation are below those previously determined by GMPR—that is, the highest price charged by the individual manufacturer in March, 1942.

Canned Crabmeat—Price ceilings for domestic canned blue and sand crabmeat were advanced 50 cents per dozen for No. ½ flat cans at the canner level on August 25, in an amendment to MPR 247. As wholesalers and retailers take mark-ups over the canner prices, the advance will be passed on at the different levels of distribution, and will mean an increase of about 6½ cents per can to the consumer.

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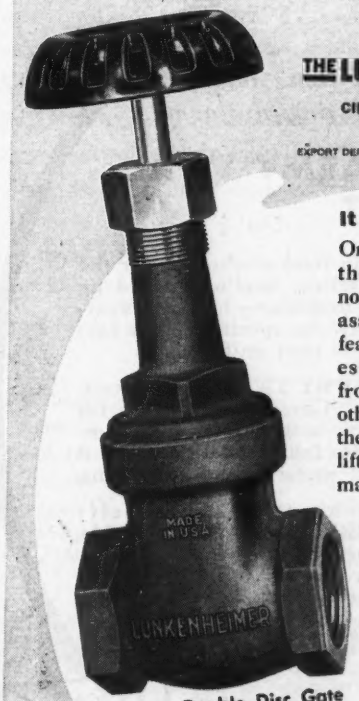

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Fluid Milk Sale Control Set Up

WFA moves to assure supplies for making of butter, cheese and other products

DESIGNED to prevent increases in consumption of fluid milk above a recent level and to maintain production of manufactured dairy products at levels to supply essential civilian needs, a system of fluid milk sale control was outlined by WFA on September 8. Milk sales areas will be established and distributors will be assigned quotas to represent maximum sales or deliveries of fluid milk, cream and other fluid milk products. The milk conservation program, established under FDO 79, goes into effect first in the areas of heavy urban population where milk supply problems are most critical.

Terming the threat to civilian supplies of butter, cheese and evaporated milk which has arisen from the continually increasing consumption of fluid milk "the number one problem on the dairy front today," WFA said that total milk output has been increased almost 10,000,000,000 lb. since 1940, the highest level which can be expected under present conditions.

Court Action Limits Food Standard Appeals

OF PARTICULAR interest to food manufacturers was the decision passed down on August 27 by the Second Circuit of the Circuit Court of Appeals against the sugar refiners, who had appealed a food standard. From the decision it would appear that many who have an interest in a new food standard do not necessarily have a right to go into a Federal Court and bring suit in protest against a food standard fixed under the Food and Drug Law.

Early this year the sugar refiners brought suit requesting that Federal Security Administrator McNutt review the order which fixed a definition and standard of identity for canned apricots, cherries, peaches and pears. They argued that the proposed standard would set up a competitive situation unfavorable to them because it permitted such fruits to be prepared with sweeteners other than sugar alone. They argued, therefore, that they had a right to appeal to the Circuit Court asking that the standard be set aside. The government contended that they had no right to appeal in the Court, and was supported in that action, without undertaking to pass upon the technical merit of the standard itself.

Officials of the F&DA are much

EXPLAINS VALUE OF CANDY

Dr. Walter H. Eddy went on the air on September 20 for the Association of Manufacturers of Confectionery and Chocolate to tell the public why candy is an essential food. Dr. Eddy is president of the American Institute of Food Products and emeritus professor of Columbia University. The radio campaign, every afternoon except Saturday and Sunday, at 3:30 to 4:00 p. m., over WOR, is the first step in a broad educational campaign on the value of candy and how to use it.

pleased with the decision because they feel that it somewhat limits the number of ways in which new standards may be subjected to court attack.

Fats, Oils Situation To Be Discussed

INDUSTRIAL fat salvage, antioxidants of vegetable oils, characteristics of frost damaged soybeans, solvent fractionation and refining of vegetable oils are among the subjects to be covered in the Fat and Oil Section of the American Oil Chemists' Society fall meeting in Chicago October 6–8. This section of the meeting should be of particular interest to food manufacturers in view of the present tight fats and oils situation.

SCHEDULE OF EVENTS

OCTOBER

3– 9—Fire Prevention Week.
4–Dec. 22—Winter course in Dairy Manufacturing, University of Wisconsin, Madison, Wis.
5– 7—American Meat Institute, annual meeting, Drake Hotel, Chicago.
6– 8—American Oil Chemists' Society, fall meeting, Palmer House, Chicago.
14—National Pickle Packers, annual meeting, Chicago.
18–19—Boston Conference on Distribution, annual meeting, Hotel Statler, Boston, Mass.

NOVEMBER

4– 5—Packaging Institute, Inc., annual meeting, Hotel New Yorker, New York.

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YEARLY FOOD ORDER:
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Booste Conveyor which is easily adjusted to accommodate cartons of various widths. Striefmann Biscuit Co.

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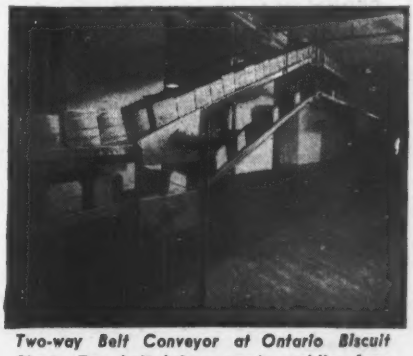
● Lamson's wide range of conveying equipment has served the food industry long and well. This should be of special interest to you, now that it is being called upon to process, package and deliver food in unprecedented quantities. Somewhere in Lamson's long experience, conveying problems similar to yours have been encountered and solved. The recommendations of Lamson engineers are based on proved fact.

● Lamson offers you "The Shortest Road to Profit in the Food Market," and other pamphlets showing Lamson conveyors at work. Write for them. Or, if you have a specific problem, let Lamson engineers help. No charge or obligation is involved.

Filled bags are moved from the filling and weighing operations through the stitchers by this Lamson Belt Conveyor at Russell Miller Milling Co.



Two-way Belt Conveyor at Ontario Biscuit Plant. Top belt brings empty caddies from floor above. Lower belt takes filled caddies to shipping or storage.

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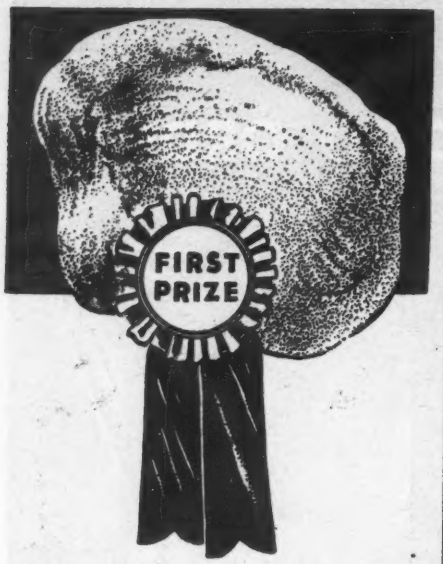

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From start to finish, every operation is continuous and completely automatic, including: cleaning, peeling, slicing, frying, drying, cooling and salting. So, production costs are low, and the labor-shortage problem is solved.

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CAPITAL VIEWS

MOLD CONTROL—Control of mold spoilage of food is largely a matter of cleanliness. Officials of the Food & Drug Administration emphasize this fact whenever anyone suggests that a chemical to reduce mold activity should be used as a component of food. Nevertheless, the use of such chemical is permissible in bread manufacture, largely as the result of a very complete case presented by the manufacturers of the chemicals. But officials openly express their hope that it will be chemicals plus cleanliness, not chemicals instead of cleanliness.

WAGE GADGETS—In drafting employment contracts there are frequently offered seemingly harmless new provisions from union offices. Some of these, like the portal-to-portal pay requirement urged by coal miners, might be added now; but if so, they would never again come out of the contracts. In some food plants make-ready time for machine adjustment is an extra under discussion. In others, time to wash up is asked for. Management officials who have a long view of fair and sound labor relations know the danger of these accessory items. When times become more difficult again we can expect an adjustment of hourly wage rates; but elimination of these extras is vastly more difficult. They should not be added now unless they are expected to be a permanent part of proper employment relations. Of course, when they are acceptable as a permanent arrangement, there is no better time than now to consider them.

INTERCHANGEABLE?—Effort is being made by War Food Administration to have more abundant food oils used instead of those that are most scarce. A special study has been made of interchangeability, especially of sulphonated oils. Food manufacturers finding difficulty in getting a preferred oil are going to find themselves under pressure to use the less scarce varieties wherever it is technically feasible. If there are still any food companies that have not tried out all such changes, they better begin right away; otherwise they may find themselves without oil supply, either of the desired or the less desirable but usable kind.

ADVICE DISTORTED—Some of the meetings of industry advisory committees are being misused by a few government officials. These folks in Washington call these meetings and nominally seek advice. Then they proceed to announce findings in such a way as to appear to do so on the recommendation of the committee. Some committees have found their ideas sadly distorted in this fashion. Committeemen sincerely seeking to aid war programs can well be alert to avoid these contingencies. They should try to serve without having their advice used as a smoke screen for mere "reform."

COST OF LIVING—There will be a cutback in the cost of living. It is doubtful whether the Office of Economic Stabilization can force prices down to the level of September, 1942, as promised. But, apparently, they are going to try very sincerely. Unfortunately for food companies, most of the cuts will have to be made in the retail prices of foods. This will narrow the margin for manufacturing and merchandizing projects still further. Very little, if any, of the cut will be made at the expense of farmers. It is a headache for everybody, including officials. And it is hard to find the economic aspirin which many of us would like to take.

GRADE LABELS—Industry has won part of its battle to prevent the reformers of OPA from requiring extensive grade labeling of goods as a part of ceiling price control. There will be continued the grade labeling of some such things as meats; but the "A, B, C" system is not going to be generally imposed on industry. We can take some comfort from this now. But the idea has not died, nor are all of these reformers out of government office, unfortunately. Hence it is important that a permanent plan be established for constructive standards programs in which the industry will participate. Having won the present round should not cover up the fact that the fight against arbitrary standards is not finished.

MORE POOR MILK—Restrictions on transport of milk and milk products have caused considerable difficulty in some communities during hot weather. Some health departments have complained that there is much sour milk or poor milk products being offered the public. The industry should get busy now and lay a sound program for more frequent deliveries next year to avoid this difficulty. By then we surely can get tires enough to move essential perishable foods like this promptly and safely.

ENOUGH PEANUTS—There will be plenty of peanuts to make butter, oil and other food products this year. The temporary substitution of peanut butter for other edible fats is being encouraged by the Department of Agriculture. The use of this and other spreads is also urged to boost bread consumption. There is no danger that this will permanently hurt the butter market, hence every food interest can back the program. And many divisions of the industry should encourage the use of peanut butter and peanut oil as food components.

FOOD COMPACTING—Many foods have more bulk during shipment than necessary. Department of Agriculture officials are therefore starting new research on methods of compacting. Industry should stir itself with the same objective. The smaller package saves scarce wrapping materials, as well as container and shipping space. However, rash changes are to be avoided because in some cases compacting of materials like dehydrated vegetables destroys their form value. In a few cases the dietetic value might even suffer a bit. Cautious but real progress must be sought.

PUERTO RICANS STUDY YEAST

Twelve young Puerto Rican scientists have come here to study the production of yeast with the aim of learning how to make "synthetic beefsteak" for their protein and vitamin hungry country. Here two of them are at work in the research laboratories of Joseph E. Seagram & Sons, Inc., Louisville, Ky. The visiting scientists expect to set up a large-scale yeast plant in Puerto Rico which will utilize some of the surplus molasses available there. The aim is to produce enough yeast to materially increase the amount of protein and B complex vitamins in the Puerto Rican diet.

Recovery of Yeast Urged by Washington

THE DEMAND for high protein materials for use in feeds still stirs Washington to urge recovery of this class of materials. Certain officials believe that there still continues substantial waste of brewers' yeast which could be so reclaimed for use. Further effort was made during August and September to prevent these losses.

Most of the recovered yeast is not expected to be of food grade. Present yeast makers for the baking and household trade are, nevertheless, reported in official circles to oppose further recovery. The argument against recovery is that it is uneconomic to go after these materials at the present market prices. This protest is answered unofficially by the argument that the need is so great as to make even uneconomic recovery a necessity in wartime.

The whole matter may come to a head again during October when decisions must be reached regarding allocation of molasses as raw material for the yeast industry. If large import from Cuba and Puerto Rico becomes a fact, this will aid greatly in the increase of food yeast supply.

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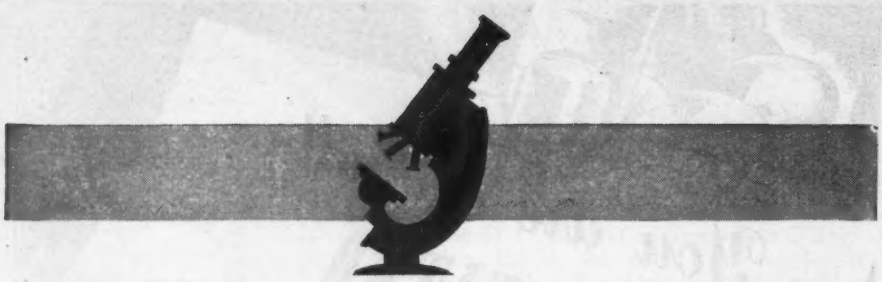

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A new brochure, "Science at Your Service", has been prepared for executives, plant managers, technologists and others in the food field.

War times present many new problems. New ingredients, new formulas, new processes, new packaging—vitamin retention, enrichment and control.

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WPB Orders

Glass Containers—Unlimited glass container quotas for shortening, higher container quotas for coffee, and certain other quota adjustments were provided in an amendment to L-103-b, issued August 24. The amount of containers previously available for shortening was limited to 65 percent of 1942 packing, but all quota limitations were removed in the new order. The coffee container quota was raised from 65 to 75 percent and the base period changed from 1942 to 1941.

Paperboard, Set-Up Boxes—WPB on September 11 imposed new restrictions on paperboard folding and set-up boxes, particularly those used to pack cereals and candy, to save 21,000 tons of paper and paperboard during the next year. The order prohibits the manufacture of individual size cereal packages to be used, singly or in multiple assortments, for retail trade after September 10, 1943.

Burlap—Improved burlap supply resulted in partially relaxed restrictions on the use and purchase of burlap bags. The amendment to M-221 issued September 13 removed quotas on farmers' and packers' purchases of new burlap bags for packing certain agricultural commodities during the balance of 1943, and permitted the purchase of new burlap bags for packing salt.

Waxed Paper—Manufacture of waxed paper and its commercial use in wrapping, especially as an overwrap or secondary cover, was prohibited on September 22 in M-351. Restrictions as to type and weight of paper and amount of wax were imposed on the production and use of such paper for a variety of food products.

Container Specifications—Several new types of standard glass containers were specified in amendment 1 to L-103 announced on September 23. Although the use of the new glass containers for food and other products is not yet compulsory, WPB would like to see manufacturers adopt the new simplified designs.

Steel Shipping Drums—Further restrictions on the use and reuse of steel shipping drums were ordered in a recent amendment to L-197. According to the amendment no person may sell or deliver any empty drum which has been used for packing an edible product, and which is capable of being reused for the same purpose, if he knows that it will be used for packing inedible products.

Chemical Exposition Opens on December 6

METHODS and materials which the processing industries have utilized in short circuiting the traditional "ten years from the laboratory beaker to the tank car" will be placed on exhibit at the 19th Exposition of the Chemical Industries, to open in Madison Square

Garden, New York, on December 6. Many of the industrial "miracles" that have been performed under wartime pressure will be reflected in the design and construction of the equipment shown by the exhibitors, as well as in the materials.

A large percentage of those who attend the exposition will be from the food industries, and many of the exhibits will be of interest to food men because they will pertain to unit operations such as materials handling, mixing, grinding, centrifuging, controlling, cooking and drying.

Nutrition Foundation Gets Industry Support

IN SUPPORT of basic research in the science of nutrition, 37 food and related manufacturers are now contributing $237,000 annually to the Nutrition Foundation. Abbotts Dairies, Philadelphia, and American Lecithin Co., New York, have become sustaining members of the Foundation.

George A. Sloan, president, recently stated that the Nutrition Foundation is now supporting 70 basic studies in 38 institutions in the United States and Canada. On the recommendation of the Scientific Advisory Committee, grants-in-aid amounting to $302,849 have been paid to these institutions since the organization of the Foundation in March, 1942.

Distributors Consider Future of New Foods

WITH AN EYE on postwar marketing, members of the National Food Distributors Association met in their 16th annual conference at Chicago, Aug. 18–21, to consider wartime food distribution problems.

Particular interest was shown in soya products and dehydrated foods, with emphasis on the packaging of these items for retail selling. Dry soup mixes were cited as an outstanding example of a new product to which the retail market had responded with enthusiasm. The size and style of the dry soup mix packages were given as much credit for the success as were the contents of the packages. A plea was made to the processors present to put soya products and dehydrated vegetables, eggs and the like in similarly convenient packages for retail selling.

Donald S. Payne, Chief, Soya Products Section, Grain Products Branch, Food Distribution Administration, highlighted the Federal program for soya foods and gave assurance that an educational promotion to the consuming public would progress as the number of soya products put on the market is in-

Hold the Line against Spoilage Losses!

CHECK BACTERIAL CONTAMINATION WITH

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You can "hold the line" against bacterial contamination of valuable food stocks, beverages and dairy products by using Mathieson HTH Products in your plant. HTH, HTH-15 and Lo-Bax are full strength chlorine sterilizers — in convenient dry form. When added to water, they form dependable, fast-killing germicidal solutions. They minimize spoilage losses . . . guard against mold...protect the purity and quality of your products.

Use HTH Products freely to flush, spray or wipe all surfaces with which foods and beverages come in contact. You'll find them economical...easy to use. Write today for complete information on Mathieson HTH Products.

Solutions made from HTH Products are also ideal sanitizing agents for use in cafeterias, locker rooms, washrooms, etc.

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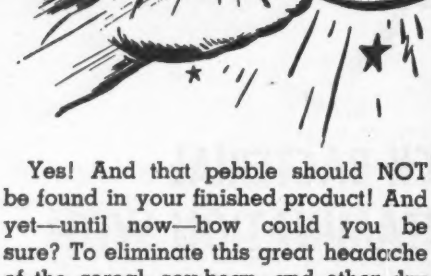
HTH PRODUCTS . . . NUPOS . . . DRY ICE . . . CARBONIC GAS . . . CAUSTIC SODA . . . AMMONIA, ANHYDROUS and AQUA . . . SODA ASH . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . PH-PLUS . . . SYNTHETIC SALT CAKE . . . SODIUM CHLORITE PRODUCTS

Yes! And that pebble should NOT be found in your finished product! And yet—until now—how could you be sure? To eliminate this great headache of the cereal, soy-bean, and other dry food processors, we have developed a new type stoner—revolutionary in design, amazing in efficiency, low in first cost, in operation. Removes stones, glass, non-magnetic metals, and all other hard, dangerous contaminations from cereals, soy-beans, and other beans, and other food products, with, 1) an action so sensitive the tiniest particles are easily removed; and 2) operating cost so low it is relatively insignificant; and 3) 99.9% efficiency. Capacity up to 16 tons per hour. Write for Bulletin FI-1043.



SUTTON, STEELE & STEELE, Inc.

DALLAS, TEXAS

In Canada — Kipp Kelly, Ltd., 68 Higgins Ave., Winnipeg

Foreign — Separations Engineering, Ltd., 133 Bush House, Aldwych, London

creased. He called attention to the various soya products and mixes already on the market, to prepared mixes containing soya flour or grits, to soya supplements to animal proteins, to the nutritive virtues of soya products and mixes, and to the compact, eye-appealing packaging of the existing soya products. He gave assurance of ample supplies of soybeans for processing into human foods.

At the dehydrated foods session, stress was laid on the progress being made in the technology of dehydration, in the packaging of dehydrated foods, and in the quantities being produced.

On exhibit at various food processors booths were numerous products consisting wholly or in part of soya ingredients and of dehydrated fruits and vegetables which were newcomers on the market.

Program of Saving Urged on Industry

WASHINGTON emphasizes that there is still need, very urgent in many areas, for conserving fuels and utilities services. Announced by OWI are the following opportunities for industry conservation:

Coal and Oil—By heat-sealing buildings; by reducing temperatures and the amount of space heated; by putting heating plants in condition so as to burn less but get more from what is burned.

Electricity—By eliminating unnecessary use of lights and electrical equipment.

Communications—By eliminating all unnecessary long-distance calls to war centers and by limiting the length of conversations.

Water—By conserving its use in all possible ways, by elimination of all waste.

Transportation—By conserving every passenger car, every truck, every tire and every spare part, by reducing travel, by emphasizing good maintenance and sharing; by making provident use of existing equipment, whether freight or passenger.

Commodity Prices Rise Slightly in Month

Except for grains, commodity prices showed only slight increases for the month from mid-August to mid-September. This is illustrated by the various indexes of the *New York Journal of Commerce*. That publication's general weekly index of wholesale commodity prices, which stood at 107.3 on August 14, 1943, rose only to 107.6 by September 11th. The same publication's index of food prices, stood at 109.2 on both dates. However, the grain prices index increased from 114 to 118 during the same four weeks.

CONSTRUCTION NEWS

	Pending (thousands)	Awarded September (thousands)	Total Awarded 1943 (thousands)
Bakery	.....	.....	.....
Beverages	$40	.....	.....
Canning and Preserving	40	.....	$195
Cold Storage	.....	.....	500
Confectionery	.....	.....	40
Grain Mill Products	40	$90	1,977
Ice Manufactured	40	.....	40
Meats and Meat-Products	75	.....	285
Milk Products	40	310	382
Miscellaneous	200	205	2,936
	$475	$605	$6,355

Among the individual food commodities, most are under ceilings and hence their spot prices showed no change. Among those with prices still free to move, wheat, No. 2, hard winter, Kansas City, rose from $1.38¼ per bu. to $1.44¾ per bu. between August 14th and Sept. 11th. Barley, malting, New York, increased from $1.33 to $1.37 per bu. in the same time, while flour fell 2 cents, from $3.67 to $3.65 per 100 lb. sack.

August Drought Causes Some Crop Decline

Dry weather in some important crop growing districts caused a slight falling off in production estimates between the August 1st and September 1st reports of the Crop Reporting Board. The reduction was apparently in the neighborhood of 1 percent, so that 1943 production will be around 7 percent below 1942, but still 4 percent greater than in any other year.

Total wheat production was estimated at 834,957,000 bu., almost 150,000,000 bu. below wheat output last year, but well above the ten-year average of 738,412,000 bushels.

Perhaps the most encouraging estimate in the report, in view of the tight feed situation, is that for the corn crop, a figure of 2,985,267,000 bu. This figure is 111,000,000 bu. greater than the August 1st estimate and begins to approach last year's record crop of 3,175,154,000 bushels.

In contrast, estimated production of oats fell off from 1,189,546,000 bu. to 1,146,060,000 bu. between August 1st and September 1st. This compares to 1,358,730,000 bu. of oats produced last year.

Among other grains and seed crops, barley showed a slight decline for the month, from 348,848,000 bu. to 333,282,000 bu.; rye was steady at 33,314,000 bu.; flaxseed increased from 54,331,000 bu. to 54,702,000 bu. (the 1942 crop was 40,660,000 bu.); rice

increased from 70,776,000 bu. to 71,217,000 bu. (compared to 66,363,000 bu. in 1942); soybeans increased from 200,328,000 bu. to 208,763,000 bu. (the 1942 crop was 209,559,000 bu.); and peanuts fell off from 2,986,450,000 lb. to 2,801,515,000 lb. (the output last year was 2,206,935,000 lb.).

Prospects for certain feed crops were reported to be poorer because of the weather. Grain sorghums fell off from 124,350,000 bu. to 102,495,000 bu. (the crop in 1942 was 107,245,000 bu.). Hay production estimate was off 2,500,000 tons to 85,112,000 tons, comparing to a 1942 crop of 92,245,000 tons.

Among other foods, dry edible beans were estimated at 22,975,000 bags compared to 19,608,000 bags last year; dry peas at 9,458,000 bags compared to 7,160,000 bags; potatoes at 460,512,000 bu., compared to 371,150,000 bu.; sweet potatoes at 71,635,000 bu. compared to 65,380,000 bu.; sugar cane at 6,586,000 tons compared to 6,044,000 tons; and sugar beets at 7,546,000 tons compared to 11,681,000 tons.

All estimates for fruit crops continued to decline slightly below previous estimates for this year, except grapes, which were reported at 2,759,000 tons in September compared to 2,671,000 tons in August.

INDICATORS

Flour produced in August, 1943, by mills producing 65 percent of United States output, was 13,696,713 sacks, according to *The Northwestern Miller*. Production for the same mills in August, 1942, was 11,807,659 sacks.

Feed grain supplies for livestock, and perhaps also grain supplies for distillers and brewers, will be improved by the WPB program to import around 20,000,000 gal. of blackstrap molasses per month for alcohol manufacture.

Cocoa imports into the United States this year, up to mid-September, were approximately 3,000,000 bags, compared to around 900,000 bags in the corresponding 1942 period.

Meat production in early September was running about 1 percent lower than in August, in spite of the largest number of livestock on record and the growing shortage of feedstuffs.

Pea crop for processing this year is now reported by USDA at 405,470 tons, compared to 1942 production of 424,010 tons.

Beet crop for canning this year is now estimated by USDA as 122,100 tons, a decrease of 10,000 tons from the 1942 production.

Lima beans, green, for processing this year are expected to total 33,070 tons, compared to an output of 37,830 tons last year.

Tomato production for processing, as reported early in September, is expected to total 2,873,000 tons this year, compared to 1942 production of 3,166,700 tons.

Snap bean production for processing this year is expected to reach 241,800 tons compared to 234,800 tons in 1942.

Corn production for processing in 1943 was reported by USDA in early September at 1,273,200 tons, compared to 1,281,300 tons last year.

Cabbage for kraut manufacture produced this year is expected by USDA to reach 142,700 tons, a decrease of 12 percent from last year's production.

Butter, creamery, produced in July, 1943, was reported by USDA at 181,335,000 lb., compared to 186,560,000 lb. in July, 1942, and to a July average in 1932-1941 of 177,700,000 pounds.

Dried egg production in July, 1943, was 21,225,000 lb., compared to 23,899,000 lb. in July, 1942.

Butter, creamery, produced in the first seven months of 1943 totaled 1,109,200,000 lb., up 0.4 percent over production for the same months of 1942, and 3 percent above the 1932-1941 average production for the period.

Cheese, American, produced in July, 1943, was reported by USDA at 87,340,000 lb., compared to 96,896,000 lb. in July, 1942, and to an average July production in 1932-1941 of 57,565,000 pounds.

Cheese, American, produced in the first seven months of 1943 totaled 490,765,000 lb., 21.8 percent below the 1942 output for the same months, but 58 percent over the 1932-1941 average for the period.

Milk, evaporated, produced in July, 1943, was reported by USDA at 335,500,000 lb., 7 percent over July, 1942, output. For the first seven months of 1943, output was 17 percent below the corresponding 1942 period.

Milk, dried whole, produced in July, 1943, was estimated at 18,250,000 lb., 220 percent over production in July, 1942. For the first seven months of 1943, production was 85,650,000 lb., compared to 32,966,000 lb. for the like period of 1942.

Milk, dried skim, produced in July, 1943, totaled 56,000,000 lb., compared to 62,400,000 lb. in July, 1942.

Chicks hatched by commercial hatcheries in July, 1943, estimated at 44,771,000, exceeded by 52 percent the output of July, 1942, which was the previous high record for the month.

Asparagus canned during 1943 is reported by National Canners Association to amount to 3,552,392 cases, all sizes, compared to 3,995,034 cases in 1942.

Oleomargarine sales in July, 1943, as indicated by sales of internal revenue stamps, totaled 33,057,697 lb., an increase of 39 percent over sales in July, 1942. For the first seven months of 1943, sales were 269,279,004 lb., up 42 percent over sales in the corresponding 1942 period.

Fruits, frozen, in storage on September 1, 1943, totaled 180,206,000 lb., compared to 207,767,000 lb. on September 1, 1942, and to an average for September 1, in 1938-1942 of 176,195,000.

Vegetables, frozen, in storage on September 1, 1943, were 128,634,000 lb. The figure a year earlier was 102,186,000 lb., while the 1938-1942 September 1 average was 79,546,000 pounds.

Butter, creamery, in storage on September 1 of this year was 231,359,000 lb., compared to 152,198,000 lb. a year earlier and to an average of 172,153,000 lb. in 1938-42 for the same date.

Cheese, all kinds, in storage on September 1, 1943, was 209,322,000 lb., compared to 279,905,000 lb. on September 1, 1942, and to a 1938-1942 average for September 1, of 178,045,000 pounds.

Eggs, case equivalent, in storage on September 1 of this year amounted to 16,635,000 cases. The figure a year earlier was 14,005,000 cases and the 1938-1942 September 1 average was 11,187,000 cases.

Poultry, frozen, all kinds, in storage on September 1, 1943, totaled 54,717,000 lb., compared to 86,645,000 lb. on September 1, 1942, and to an average of 74,401,000 lb. for the date in 1938-1942.

Meat, all kinds, in cure and frozen storage on September 1 of this year totaled 722,065,000 lb. This compared to 521,272,000 lb. on September 1, 1942, and to a 513,220,000 lb. average for the date in 1938-1942.

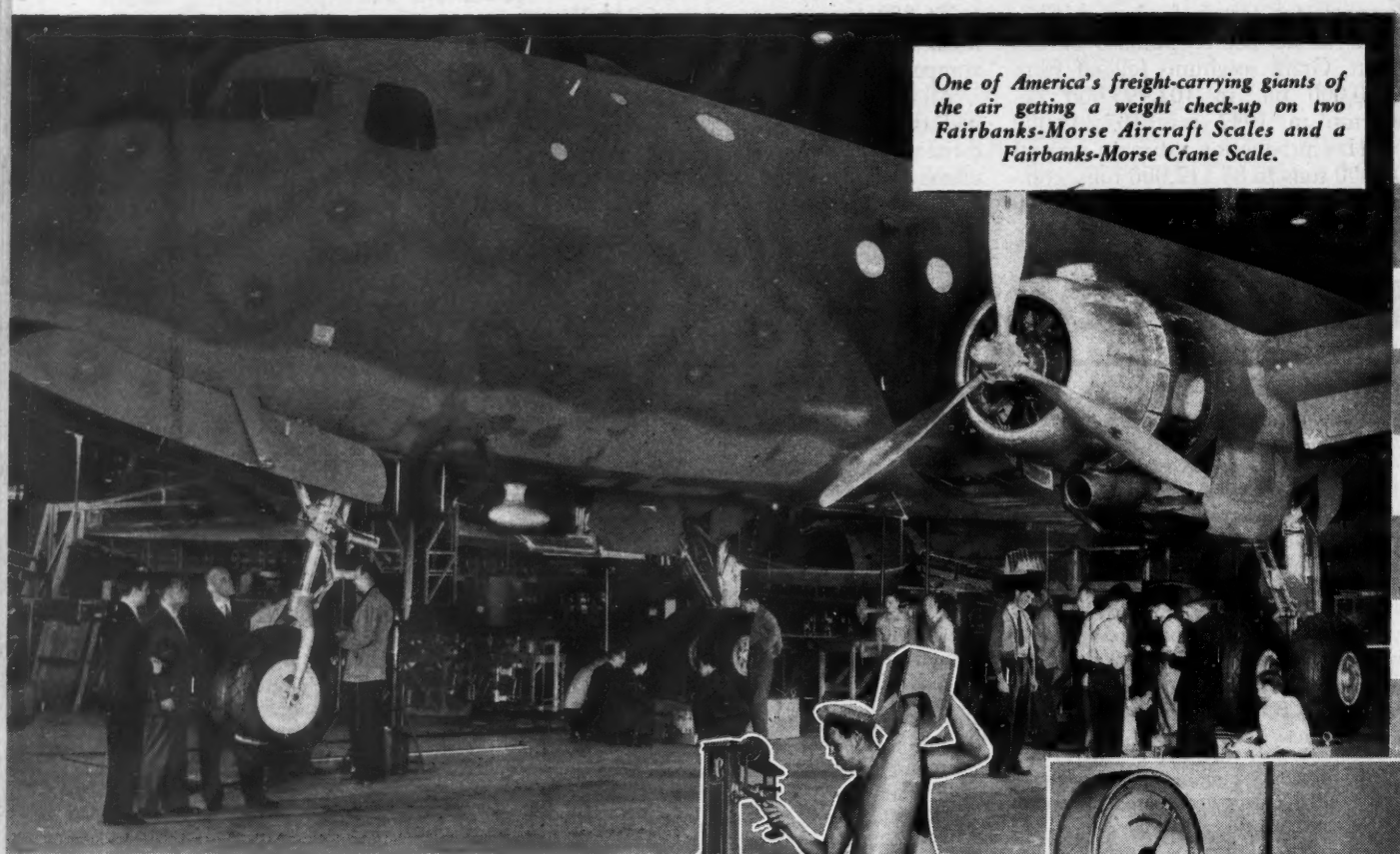
Lard in storage, September 1, 1943, was 227,623,000 lb. and rendered pork fat in storage on the same day was 33,350,000 lb. The combined total for these products on September 1, 1942, was 85,274,000 lb. and the average for these products in 1938-1942 was 174,527,000 lb. for the same date.

Business activity index of *Business Week* on September 11, 1943, stood at 212.3, compared to 211.0 a month earlier and to 188.0 for the corresponding date in 1942.

Weekly wholesale food price index of Dun & Bradstreet stood at $4.06 on September 7, 1943, compared to $4.04 on August 3, 1943, and to $3.81 for the corresponding 1942 September date.

Cost of living index of National Industrial Conference Board was 102.8 in August, 1943, compared to 103.1 in July, 1943, and to 98.1 in August, 1942.

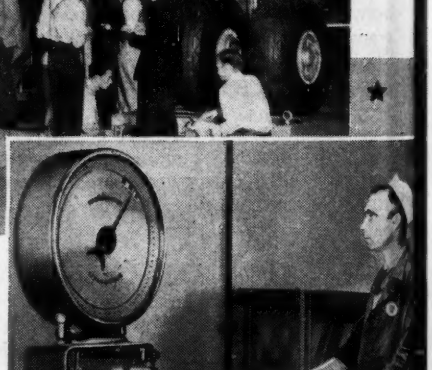
Fairbanks-Morse Scales in Warwork



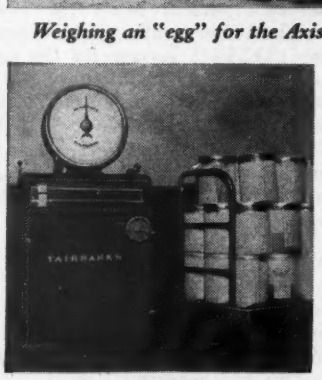
One of America's freight-carrying giants of the air getting a weight check-up on two Fairbanks-Morse Aircraft Scales and a Fairbanks-Morse Crane Scale.

• WARWORK means *weigh-work* for Fairbanks-Morse Scales. They're weighing munitions . . . food . . . chemicals . . . tanks . . . aircraft . . . shells . . . just about everything, in fact. They are weighing at speeds which human hands can't match. They're weighing with accuracy that human eyes can't equal. They're working in endless shifts that human stamina can't endure. They're helping to speed up America's war effort on the production front, for Fairbanks-Morse Scales are "at home" on the production front, in peace or in war. Fairbanks, Morse & Co., Fairbanks-Morse Building, Chicago, Illinois.

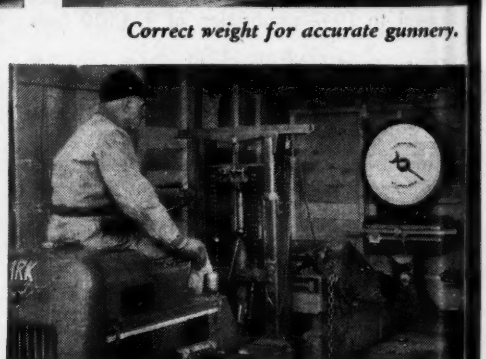
Weighing an "egg" for the Axis.



Correct weight for accurate gunnery.



Frozen eggs—NOT for the Axis!

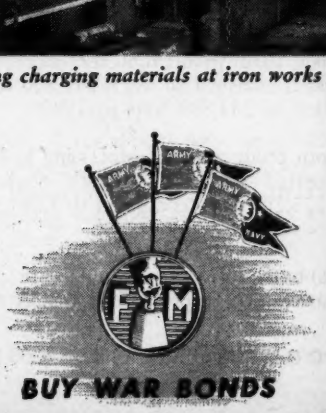


Weighing charging materials at iron works furn

FAIRBANKS-MORSE

DIESEL ENGINES
PUMPS
MOTORS
GENERATORS
WATER SYSTEMS
SCALES
STOKERS
FARM EQUIPMENT
RAILROAD EQUIPMENT

Scales



BUY WAR BONDS

MEN • JOBS • COMPANIES

INDUSTRY

Alaska Fish Co., a subsidiary of Alaska Fish Oil Extractors Co. in Chicago, Ill., are now packing shark meat.

Armour Creameries' Springfield, Mo., egg plant, and Nescafe, a division of Nestle's Milk Products Co., in Sunbury, Ohio, have been presented the Army-Navy "E" award for excellence in production. The Armour plant is the first company in the powdered egg field to receive the "E".

Borden Co. in New York has recently acquired Poinsettia Dairy Products, Inc., Tampa, Fla. W. J. Barritt will be chairman of the board and W. J. Barritt, Jr., becomes president of the new division.

Canin Canning Co., Springdale, Ark., has recently begun the processing of Irish potatoes for Government use.

Chickamauga Producers, Inc., has begun operation of a new $50,000 fruit and vegetable freezing plant in Dayton, Tenn., and plans to pack between 1,500,000 and 2,000,000 lb. of food this year.

College Inn Food Products Co. and **E. J. Brach & Sons**, both in Chicago, Ill., have been presented the Army-Navy "E" for outstanding achievement in production.

Farm Crest Bakeries, Inc., with headquarters in Detroit, Mich., has spectacular full-color "action in war" oil paintings on its trucks to help promote the sale of U. S. War Bonds.

Kirkland Provision Co.'s cannery in Charleston, N. C., has recently been damaged by fire, with estimated loss at $50,000.

Kraft Cheese Corp., Chicago, Ill., has purchased the Maury Creameries, Inc., in Columbia, Tenn.

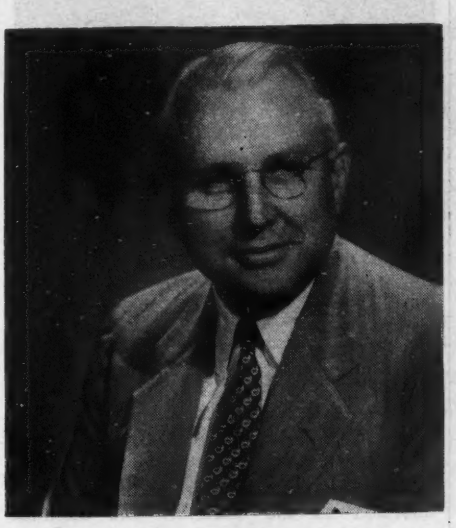
Louisiana Packing Co., newly formed organization in Hammond, La., has recently begun operation and plans to pack shrimp as a specialty product.

Michigan Macaroni Manufacturing Co. was recently damaged by fire amounting to $100,000.

John Nagle Co. of Boston and the Atlantic Coast Fisheries Co. have acquired the Cape Cod Fisheries in Provincetown, Mass.

Quaker Oats Co. of Canada, Ltd., has now been incorporated as an extraprovincial company in British Columbia with the executive offices at Peterborough, Ont.

St. Marys Packing Co., Sidney, Ohio, has taken over Glenwood Canning Co., Glenwood, Ind., which will operate as a unit of St. Marys.



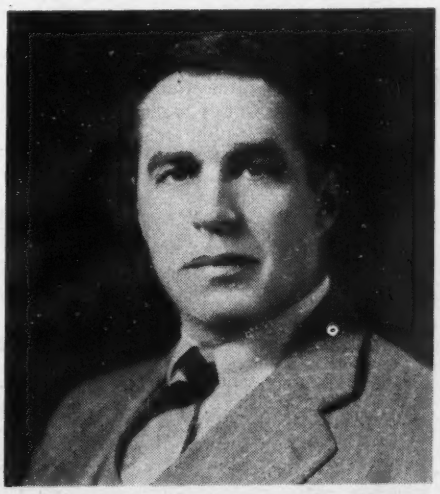
H. P. BROWN

THOMAS K. CARNES

The National Dairy Products Corp. in New York has appointed Thomas K. Carnes, formerly comptroller of the organization, to the office of vice-president, and H. P. Brown to succeed him as comptroller. Prior to his appointment, Mr. Brown had been in charge of two of the company's subsidiaries in Kansas City.

Sardik Food Products Corp., New York, manufacturer of dehydrated food products, has sold a controlling interest to National Distillers Products Corp. National Distillers immediate plans will be to increase research activities, emphasizing the possible utilization of byproducts from whiskey manufacture in dehydrated foods for human consumption.

The Simplot dehydrating plant at Caldwell, Idaho, is expanding operations to meet a goal of 20,000,000 lb. of dehydrated potatoes and 2,000,000 lb. of dehydrated onions for 1943.



DUNCAN R. MAC KENZIE

Duncan R. MacKenzie, formerly vice-president of Bosco, Inc., has been appointed vice-president in charge of manufacturing and research for R. B. Davis Co. in Hoboken, manufacturer of baking powder and "Cocomalt," and vice-president of R. B. Davis Sales Co.

Tropical Fruits Laboratory, Inc., has been newly organized in Miami, Fla., manufacturing products made from papaya, including juice, soft drinks—Tropa Cola and Cuba Rica—wines and liqueurs. E. J. Hess, founder and president, has devoted the past 15 years to research and is largely responsible for the development of papaya products for the company.

PERSONNEL

H. C. Aitken has resigned his position with the Canadian Government Agricultural Experiment Station at Kentville, N. S., to take charge of production and research on new products for Graham's Dried Foods, Ltd., Belleville, Ont., manufacturers of dehydrated vegetables.

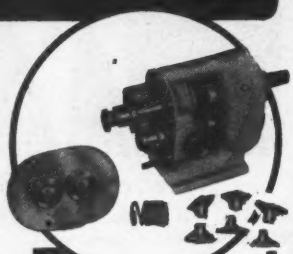
C. E. Baker, Jr., formerly of Rodney Milling Co. and Schultz, Baujan & Co., has been appointed superintendent and production manager of the Slater Mill & Elevator Co., Slater, Mo.

Frank C. Baker, formerly general manager of plant and production for the Chicago, Ill., milk division of Borden Co., is now situated in the company's New York office. Arthur Beckman, formerly manager of Borden's Hammond, Ind., plant and recently head of sales for the Chicago division, will succeed Mr. Baker in Chicago.

Theodore C. Byerly, chief of the poultry division of the Bureau of Animal Industry at the Beltsville, Md., research center of USDA, has been awarded the 1943 Borden Award in poultry science in recognition of his work in the field of physiological research.

WARTIME FOOD PROCESSING PLANTS *Appreciate this* BUMP PUMP

USED FOR PUMPING



Canned Foods
Yeast Malt
Tomato Juice
Citrus Juice
Salad Dressings
Baby Foods
Oils and Fats
Ground Meat
Mayonnaize
Dog Food
Milk
Ice Cream
Cheese
Beer
Syrup
Fudge
Acids
Vinegar
Crushed Fruit
Wine and Grapes
Liquor
Chocolate
Eggs
Cream

The food processing plants who are fortunate to have Bump Pumps now in operation appreciate their volume, as Bump Pumps enable them to continue with uninterrupted production during these critical times.

Backed by 13 years of successful experience and service to the industry. Bump Pumps combine the advantages of reciprocating, centrifugal and rotary type pumps. They are positive action that operate at slow speeds, self-priming under high vacuums or against head pressures, delivering a constant volume per revolution without churning action or agitation within the pump. Thin, or viscous, hot or cold liquids, semi-liquids — and even solid bearing liquids and pulps can be pumped successfully.

Every possible production hour in our plant is devoted to making implements of war, but needed pump equipment can still be supplied.

CAPACITIES *from* ONE *to* 300 GALLONS *per* MINUTE!

TAKE CARE OF THE PUMPS YOU NOW HAVE!

BULLETINS showing full specifications, sizes, capacities—upon request.

The BUMP PUMP CO.
LA CROSSE ★ WISCONSIN

A. S. THATCHER

Loose-Wiles Biscuit Co., Long Island City, N. Y., has elected A. S. Thatcher director of applied research in the general manufacturing department. Mr. Thatcher is well informed on the technical and scientific phases of the company's activities.

James R. Collins has been made assistant general manager and Lester H. McLaren has been appointed director of the laboratory of Michigan Bakeries, Inc., Grand Rapids, Mich.

S. H. Davis, formerly manager of the Grocery Sales Department of Standard Brands, Inc., New York, N. Y., is now with Donaldson Baking Co., Columbus, Ohio.

William M. Evarts, assistant treasurer and secretary of Spencer Kellogg & Sons, Inc., Buffalo, N. Y., has retired after 46 years of service with the company.

William C. Herbert has again become vice-president and general manager of Atlas Baking Co., Richmond, Va.

C. E. Johnson has been appointed secretary of Kelling Nut Co., Chicago, Ill., manufacturer of salted nuts and peanuts. In addition to his duties as secretary, he will act as director of public relations for the company.

John M. Kohr, assistant food technologist at Gorton-Pew Fisheries Co., has been promoted to the position of production manager of manufacturing operations at the company's Gloucester, Mass., plants.

J. J. LeClare, general sales manager of the Diamond Crystal Salt Division of General Foods Corp., has been elected vice-president in charge of sales.

Neil Morgan, formerly with the test bakery of Continental Baking Co., has joined Basic Flavors Co., as a consultant to bakers in helping them solve production problems.

William C. Pratt has resigned as manager of the northwest division of Russell-Miller Milling Co., Minneapolis, Minn., to become vice-president in charge of sales for Dawe's Products Co., Chicago, Ill.

Earl C. Rasmussen, formerly assistant chief chemist of the Chicago Baking Powder Division of Standard Brands, Inc., has joined the research chemical staff of Griffith Laboratories in Chicago.

R. W. Upshaw, assistant general manager of Anheuser-Busch, Inc., St. Louis, has recently been named vice-president of the company.

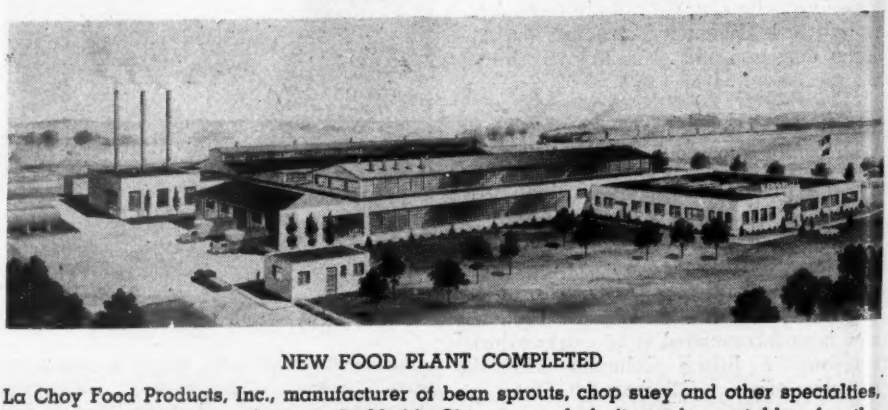
W. P. Woodley, vice-president of Columbian Peanut Co., Norfolk, Va., has been elected president of the National Peanut Council, Inc.

DEATHS

Joseph J. Arnold, 2nd, 42, assistant treasurer of Lonsdale Bakery Co., Saylesville, R. I., recently, in Pawtucket, R. I.

Gustaf Arvidson, 47, president and treasurer of the Commonwealth Baking Co., Worcester, Mass., and a member of the New England Bakers Association, Sept. 10.

William Bittles, 76, founder of Wagner Baking Co., Newark, N. J., and former president of Pie Bakers of America, Inc., Aug. 30, in West Orange, N. J.



NEW FOOD PLANT COMPLETED

La Choy Food Products, Inc., manufacturer of bean sprouts, chop suey and other specialties, has completed its new plant at Archbold, Ohio, to pack fruits and vegetables for the duration. Since its line of Chinese foods was considered non-essential by WPB, plans were made to acquire a new plant and use its equipment in packing essential foods for which containers are available. Equipment for packing its former items has been installed and production will be resumed when tin or glass containers can be had.

Roy M. Davis, 61, assistant treasurer of General Foods Corp. in New York, Aug. 30, in White Plains, N. Y. In recent years he has been in charge of financial operations for General Foods quick frozen foods. He was treasurer of Frosted Foods Sales Corp., B. E. Maling, Inc. and Q-F-Wholesalers, Inc.

Ira H. Fill, for many years general manager of the southern territory for Southern Dairies, Inc., and later president of Southern Maid Corp. of Johnson City, Tenn., recently, in Richmond, Va.

Alonzo C. Monagle, 64, former vice-president of Standard Brands, Inc., recently, in Brooklyn, N. Y.

Manuel Rionda, 80, president and director of Czarnikow-Rionda Co. in New York, importers of Cuban sugar, Sept. 2, in Alpine, N. J.

ASSOCIATED INDUSTRIES

Bristol Co., Waterbury, Conn.; Creamery Package Manufacturing Co.'s Fort Atkinson plant in Fort Atkinson, Wis.; Dewey & Almy Chemical Co., Cambridge, Mass.; Hydrawmatic Machine Corp., New York; the Pershing Road plant in Chicago of Link-Belt Co.; Novocal Chemical Co., Inc., Brooklyn, N. Y.; and Pfaudler Co.'s Elyria Division, Elyria, Ohio, have been awarded the Army-Navy "E" award for excellence in production. The Bridgeport, Conn., plant of Jenkins Bros. and Buffalo Pumps, Inc., Buffalo, N. Y., were presented a second star for their pennant, while International Nickel Co. of Canada, Ltd., Huntington Works, Huntington, W. Va., and Miehle Printing Press & Manufacturing Co., Chicago, have achieved the honor of qualifying for four-star renewals of the award.

Brown Co. of Berlin, N. H., manufacturer of wood pulp, papers and chemicals has appointed Frederic C. Coburn president and director of the company.

Buffalo Foundry & Machine Co., Buffalo, N. Y., has acquired the entire line of Dopp kettles, formerly built by Sowers Manufacturing Co. Dopp kettles have been extensively used for heating, cooling and mixing operations throughout the chemical, process and food industries.

Continental Can Co. in New York, has promoted H. A. Goodwin, formerly advertising manager for the past 15 years, to the position of director of sales development. R. R. Carlier becomes advertising manager succeeding Mr. Goodwin.

Crown Can Co., Philadelphia, Pa., has elected S. Carle Cooling to the office of vice-president, in charge of Packers Can Division sales.

Worthington Pump and Machinery Corp., Harrison, N. J., has acquired Ransome Machinery Co., of Dunellen, N. J.

YES SIR!
Bemis WATERPROOF Bags deliver full weight

You can say "goodbye" to weight loss and shrinkage in storage or transit, if you pack in Bemis Waterproof Bags. For these sturdy laminated bags are constructed to prevent losses either by evaporation or sifting. And they are made *extra strong* to stand the strain of shipping in these days when trucks and cars are loaded to capacity.

Tough, closely woven fabric forms the outside of Bemis Waterproof Bags. This fabric is *bonded,* by special adhesives, to layers of paper in any combination *your* individual problem requires.

For example, Bemis Waterproof Bags can be made that keep moisture in and dampness out . . . retain desirable aromas and repel objectionable odors . . . keep out dust and dirt . . . resist greases and acids.

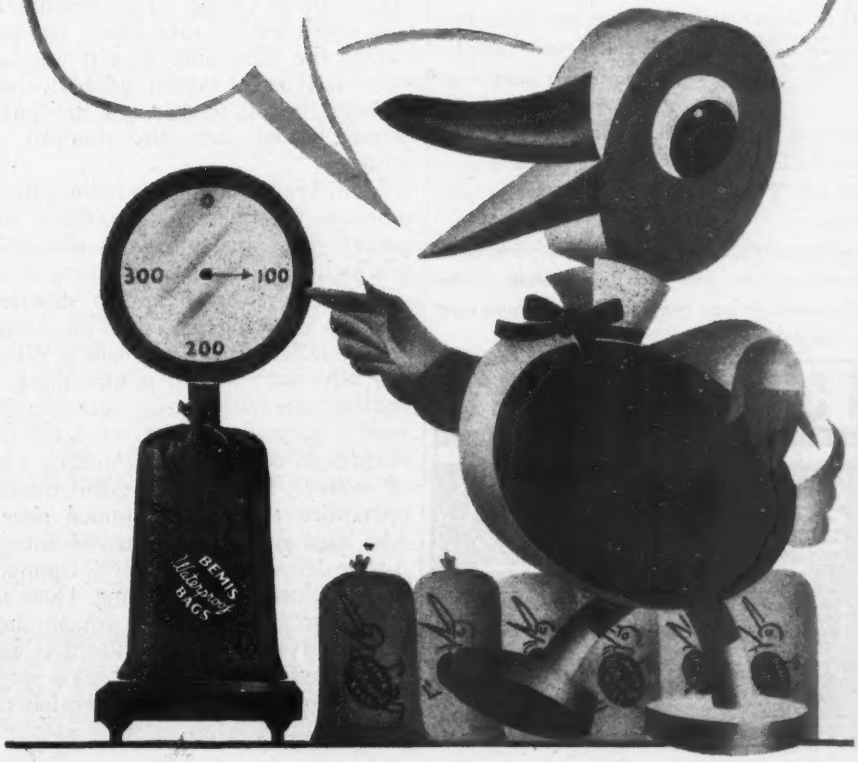
Our engineering department will work with you in developing bags tailor-made to your needs. Details and samples sent promptly on request.

WATERPROOF DEPARTMENT

BEMIS BRO. BAG CO.

St. Louis • Brooklyn

BETTER BAGS FOR 85 YEARS



Turkeys, 44,000 lb. at Once, Quick-frozen with FRICK Refrigeration

That's a common occurrence in the big packing plant of the Jerpe Commission Co., C. A. Swanson and Sons, at Omaha, Nebraska.

Here three large Frick Refrigerating Machines hold temperatures in the freezing tunnel far below zero F. Overhead fans maintain a blast of very cold air over the poultry or other foods. (Meat, vegetables, fruit, or dairy products can all be handled with equal facility.)

U. S. soldiers, sailors, marines, and aviators use quick-frozen foods by the millions of pounds daily.

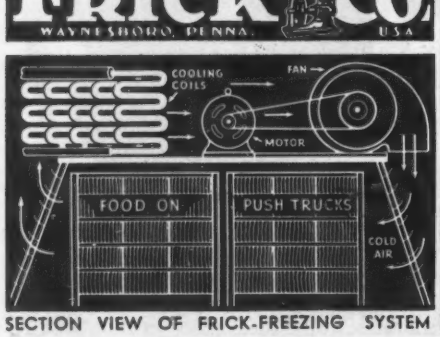
Engineering tests show that when the air blast is kept cold enough, it can absorb but little moisture from the foods. Turkeys and all other poultry come out with 99-66/100 per cent of their original weight.

Millions of pounds of fresh foods are being quick-frozen every day with Frick Refrigeration. It's the ultimate where both quality and large volume must be maintained.

DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

WAYNESBORO, PENNA., U.S.A.



SECTION VIEW OF FRICK-FREEZING SYSTEM

Cooking Food for Freezing

(*Continued from page 69*)

oz. of cinnamon, 6 oz. of whole cloves and 4 oz. of mace, and the fat available from cooking the pork, water being added to make the total weight 900 lb. With these proportions the finished product contains 69 percent moisture, which is within the 70 percent legal limit for canned pork and beans. After packaging, the pork and beans should be frozen and stored at 0 deg. F. or below.

For serving, the product should be partially thawed in the package to prevent overcooking and mashing of the outside layer before the center portion is thawed during cooking. It is best heated to serving temperature in a casserole in the oven or in a double boiler on top of the stove.

The Raw Material Problem

(*Continued from page 82*)

the field, in trucks or cars, or delivered to the plant. While there is a natural tendency to try to write these contracts at the lowest possible figure that will get action, I doubt very much whether many dehydrators know with any accuracy how much extra they could afford to pay for a product properly sized and prepared. Here is a startling fact, but true. Suppose a grower had a ton of carrots, all of large size, that he was willing to sell for $35 a ton. Suppose he also had some small carrots which he was willing to throw in with the big ones without charge. The mixture is now worth less, in total value, not per ton, to the dehydrator than it was before. In fact, it would generally pay to have the lot sorted, and the small carrots hauled away and dumped as waste.

Many beautiful schemes to solve these problems fail to take into account the grower. The large grower is obviously of a highly speculative disposition, or he wouldn't be in such a crap shooters' business as raising vegetables on a commercial scale for the fresh market. When you offer such a man a sure thing, a small return but a rather sure one, he would generally prefer to take his chances on either losing or making a lot of money. That is the reason for the open-price contract mentioned above. The large grower has many advantages for the dehydrator. He is well equipped with machinery, for one thing. There are fewer contracts to watch, for another. But most important of all, the large grower knows that you have to spend money to make money, and he has the courage to back up his bets with real money and lots of it. On the other hand, the typical small grain grower, let's say, could just as well raise vegetables, given proper supervision. But where he will fall down is that usually at some time in the course of growing the crop there will be need for a sudden and heavy outlay of money, for extra cultivation, fertilizer, dusting, or what not. Faced with an actual cash outlay of $30 or $40 an acre, your typical "small shot" will fold up, either quit cold or try to get by with some inexpensive substitute. If he loses the crop by such means, the dehydrator is usually out the seed, and in addition, he has to scramble out into the market to buy what he can to keep running. Perhaps the ideal solution is for the dehydrator to own his acreage.

In the last year or two, it has been my lot to talk to hundreds of persons who were seriously considering going into the dehydration of vegetables. It was the rare case where they had given real thought to the program for raw material procurement. They usually say, "Oh, we can buy all we want around there," or, "Our broker has undertaken to supply us." And many have some dream of running a plant on crop excesses bought at distress prices, or rejected materials from other processes. The misconceptions of this group are bad enough, but understandable. That most of the existing dehydrators are going into the next season with no raw material program worthy of the name is just plain mysterious.

Some of the commoner ways of getting larger sizes are wider spacing of rows, special extra wide planting shoes, using much less seed per acre, fertilizers and extra thinning. In climates where almost year around crops are possible, a real trick is to keep the crops coming along in such rotation that the factory is never oversupplied nor out of product. Not all the problems of making vegetables mature on a year around schedule are yet solved by any means. It is surprising how many things are not known about what seem to be rather simple questions. When horticulture gets off the beaten path it can tell you nothing except by the hard way, by trying it. One of the great fields for development seems to be improved harvesting methods, suitable for the dehydrator, and less expensive in field labor.

I haven't been able to forget the story one man told me about his experience of shipping Idaho potatoes several hundred miles to his plant. They came in at the rate of three cars a day. A rail tie-up left him without any potatoes for seven days, followed by a single shipment of 21 cars which arrived in the middle of a spell of subzero weather! This might be called the raw material nightmare.

Quick Freezing Plant

(*Continued from page 68*)

The company also froze one and a quarter million pounds of strawberries last season, of which approximately 900,000 lb. was frozen by the air-blast process, in 30-lb. containers, for ice cream manufacturers. The remainder was frozen by the immersion method and packaged in 20-lb. containers for pie bakers.

The Dixie freezing operations are housed in a twin-shed type of frame building, approximately 60 by 140 ft. overall, and with the refrigerated space insulated with sawdust and shavings. In one of the two sheds are the preparation department and the immersion freezer. In the other shed is the chill room, the zero storage room and the compressor room. The layout also includes a lean-to office space and toilet facilities for men and women.

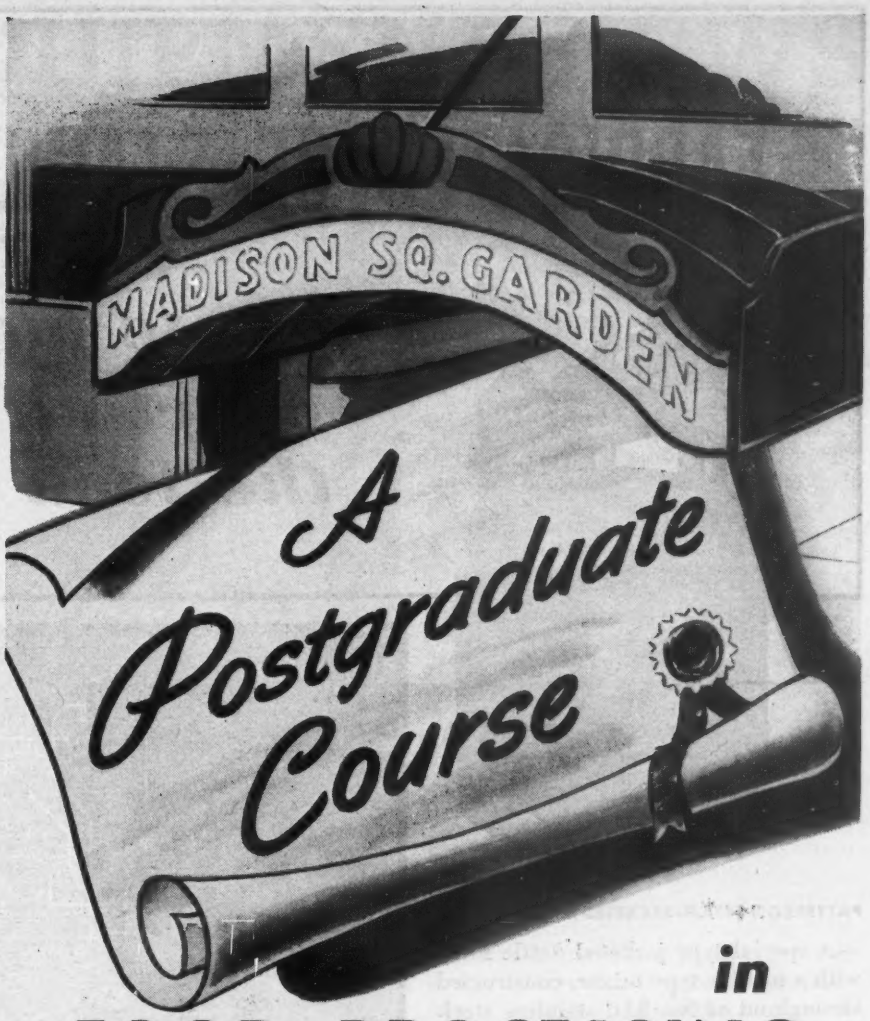
Located adjacent to the main plant is a Hamacheck hulling machine through which English peas, crowder peas and lima beans are put before going on to the production line inside the plant.

Refrigeration for the freezing and storage operations is supplied by a York 12x12½-in. compressor driven by a 100-hp. motor, a York 7½x7½-in. compressor with a 25-hp. motor and a Baker booster compressor powered by a 28-hp. motor. The refrigeration is flexibly arranged so that it may be cut in, cross connected or cut out as the loads demand. In the chill room there are 2,300 ft. of ammonia coils and a 7½-ton floor-type blower which circulates the air. The storage room, where the temperature is zero or lower, is equipped with a 15-ton floor-type blower.

Steam for blanching and other plant process is generated in a 30-hp. boiler located in a separate boiler house.

So that the company can closely regulate the quality of its products, it is installing a control laboratory where quality tests may be made as a check on processing operations. An important function of this laboratory will be to check the blanching time required to inactivate the enzymes in the raw material.

Situated in an area where the growing season is long, Dixie Frosted Foods expects to operate practically the year around. It packs a wide variety of products, including snap beans, lima beans, English peas, crowder peas, corn, strawberries, peaches, blueberries and turnip greens. It may pack seafoods from the Gulf Coast during one or two winter months. To date the operations of the company have proved so successful that one or more similar plants may be established.



in

FOOD PROCESSING

Under one roof, in New York's Madison Square Garden, this year's Exposition of Chemical Industries will present a notable educational opportunity. There, during the week of December 6-11, 1943, the technical men and executives of the food industries will find the equivalent of a post-graduate course in chemistry and engineering applied to their own problems.

In common with other fields, the food industries are faced with a growing number of new problems and a multiplication of older ones—all brought about by war conditions and post-war plans. To an unprecedented extent, chemistry and chemical engineering have broadened their ability to help solve many of these problems—through new products of chemistry and new processes made possible by modern equipment. The producers of such products and equipment who will exhibit at this Exposition will have their technical men on hand for consultation and advice. Visitors will profit by availing themselves of such service.

Admission to the Exposition of Chemical Industries is by invitation and registration. As the general public is not admitted, you will find here every facility for a thoroughgoing study of the chemical and engineering developments of prime interest to you.

By all means come—and bring your associates.

19th EXPOSITION OF CHEMICAL INDUSTRIES

MADISON SQUARE GARDEN • NEW YORK • DEC. 6-11, 1943

Managed by International Exposition Co.

FABRICATED OF STAINLESS STEEL

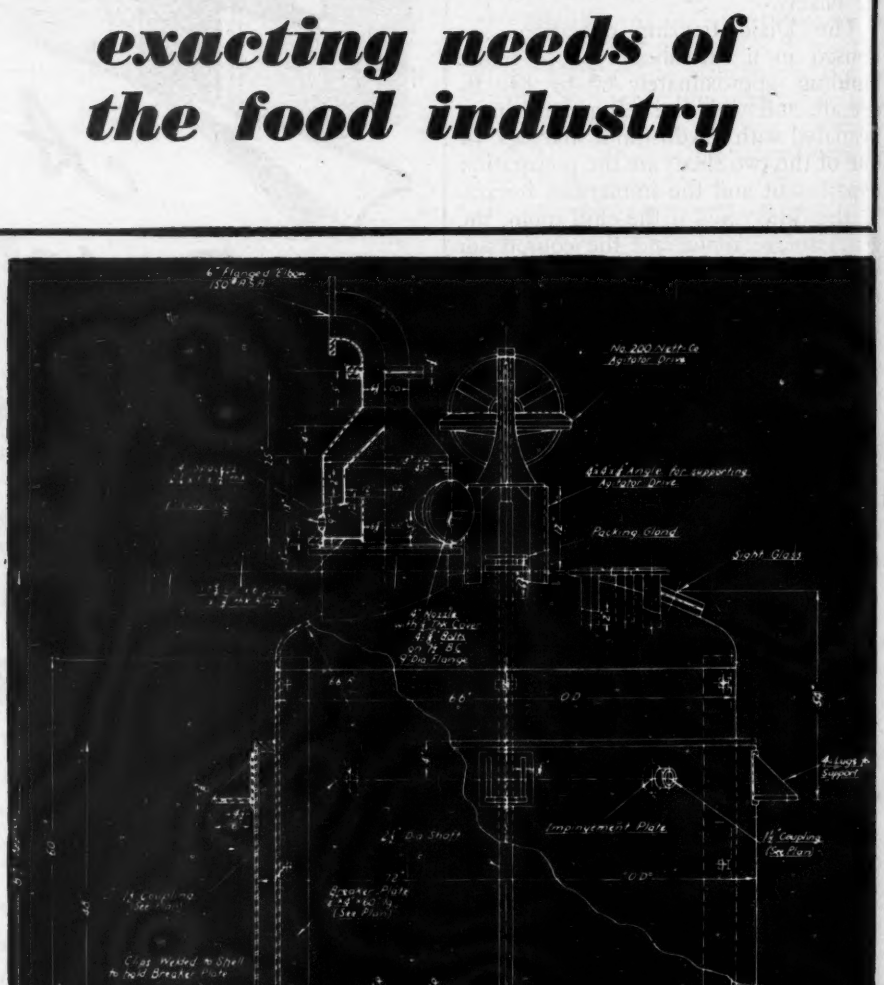
—to meet the exacting needs of the food industry

PATTERSON STEAM-JACKETED MIXING KETTLE

—A special type jacketed kettle fitted with a turbine-type mixer, constructed throughout of No. 316 stainless steel. Shell and heads constructed of stainless steel ⅜" thick. Steam jackets of carbon steel. Built for a working pressure of 75 lbs.

A.S.M.E. APPROVED DRAWING →

—This type of kettle may be adapted to straight mixing, or to a combined mixing and simple distillation problem. The vapor-dome is ideal for separating entrained moisture from a distillate vapor.



FACED WITH A TOUGH DEHYDRATION PROBLEM?

Call in Patterson-Kelley engineers. In step with the rapid development of food dehydration, we offer a complete line of kettles, cookers, mixers.

EST. 1880

THE Patterson-Kelley CO., INC.

114 WARREN ST., EAST STROUDSBURG, PA.

MANUFACTURERS FOR THE FOOD AND PROCESS INDUSTRIES

FOOD EQUIPMENT NEWS

Concrete Floor Hardener

WILBUR & WILLIAMS Co., Park Square Bldg., Boston, Mass., has brought out "Dye-Crete" color hardener for coloring and hardening concrete floors. With this hardener, it is not necessary to etch the surface of the floor in order to neutralize the alkaline content of the concrete. The manufacturer also states that the material will penetrate and carry the color deep into the cement.

Using this material in colors, the color hardener in the desired color is applied and allowed to dry from one to three hours, depending on drying speed. This is then followed by a coat of "Dye-Crete Defensite" coating. If an enamel finish is required, the finish coat should be the same color as the first coat. If a glossy texture finish is required clear coating is used for the finished coat.

In cases where a concrete floor is dusting, but no color is required, clear (uncolored) material is applied in two coats. The first coat is allowed to dry twelve hours before the second coat is applied. Two coats are essential when using the clear material. The result is claimed to be a non-dusting surface highly resistant to traffic. Coverage obtained from this concrete hardener is said to range between 150 to 400 sq. ft. per gal., depending on the surface.

Air Heaters for Processing

DRAVO CORPORATION, 300 Penn Ave., Pittsburgh, Pa., has brought out a direct fired air heater suitable for use in dehydration and other processes. This heater, made without the use of critical alloys steels, provides output temperatures between 150 and 350 deg. F. Air heating is obtained from heaters with carbon steel combustion chambers, by means of a recirculating device. This device allows heated air to be fed back to the heater's intake, so that the normal temperature rise obtainable by circulating air around the firebox will produce any temperature up to 350 deg. F., depending upon the percentage of the total air flow that is recirculated. This percentage is regulated by a damper in the recirculating duct. To obtain 350 deg. F. temperature, 80 percent recirculation is required.

Advantages claimed for these heaters include saving of fuel because of high efficiency of heat abstraction and low radiation losses, heated air free from contamination obtained from direct fired coal or oil burning heaters, ease of installation, availability for quick shipment, flexibility of the installation as

Air heater for dehydration or processing.

regards later plant extension, and the fact that skilled labor is not required for operation. These heaters are available for coal, oil or gas fuel, and those designed for coal can be converted to oil or gas when these fuels become more available.

Lubricating System

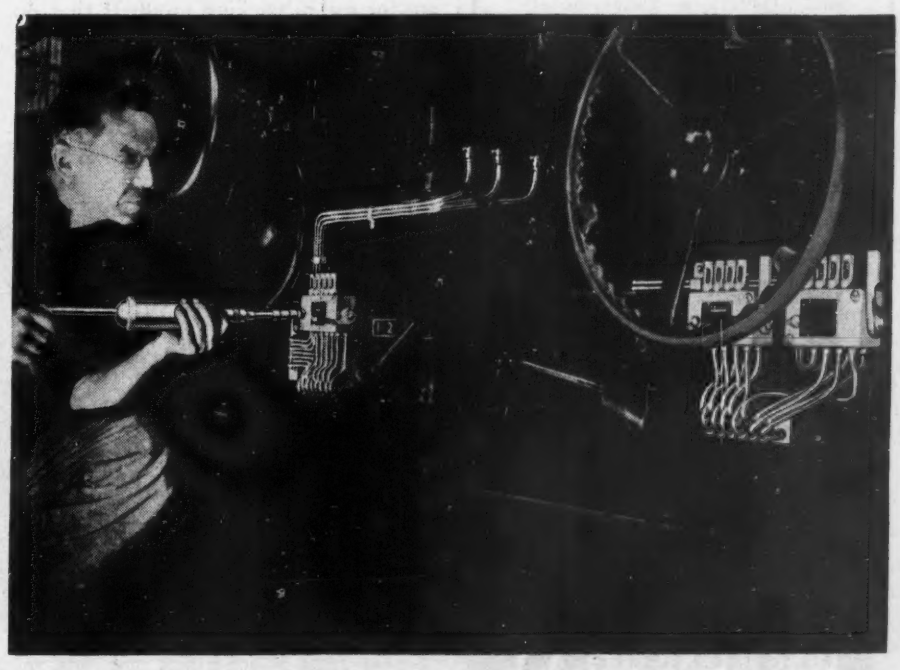
FARVAL CORP., 3250 East 80th St., Cleveland, Ohio, has brought out the improved "Multival" system, for positive lubrication of all bearings on a machine. With this equipment, oil or grease is delivered to the distributing blocks by means of a manual or power operated portable gun, which serves as a central pump. The complete equipment consists of the multiple valve blocks, each serving from 2 to 10 bearings, lubricant lines leading to individual points, and suitable fittings to accommodate practically any type of bearing connection. Each measuring valve can be individually adjusted to deliver the exact amount of lubricant required by the bearings it serves. A tell-tale on each valve piston indicates the positive delivery of lubricant to each bearing.

Fast Food Freezer

A NEW fast freezing unit capable of handling nearly all types of vegetables, fresh fruits, seafood and poultry at the rate of three tons an hour has been developed by the York Ice Machinery Corp., York, Pa. The foods can be processed both in the loose and packaged form.

One of the features of the freezer is its rapid defrosting equipment, which permits a minimum of production interruption, and immediate resumption of peak production as soon as frost is removed from the freezing coils. The design also makes it possible to combine two or more machines into a single unit to conform with individual plant layouts. The freezers can also be operated side by side to provide a parallel production line for freezing both loose frozen and packaged products at the same time.

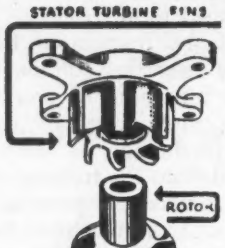
Built in two sizes, the largest model



Centralized lubricating system.

S-T-R-E-T-C-H
Man Hours

WITH
HOMO-MIXER'S
ADVANCED PRINCIPLE



INDUSTRY must win the race against time! But more than a great time-saver is the Eppenbach HOMO-MIXER. It's also engineered for finer diffusion.

Its principle is wholly different. There is no vortex, no air to affect the mixture. Only a fraction of the mass is worked at one time, creating more uniform dispersion. The material is rapidly forced up from the air-free bottom by the stationary turbine fins. With tremendous pressure and turbulence, the flow surges upward, outward and down. The entire batch completes this cycle in just a minute or two. No clamping to tank, no setting at angle, no vibration.

HOMO-MIXERS are doing a big job in process plants today — batteries up to a hundred! Write us!

EPPENBACH
INCORPORATED
Processing Equipment for Over 30 Years
44-02 11th STREET
LONG ISLAND CITY, N. Y.

is capable of holding 10 food trucks at a time in various stages of the freezing process and has a capacity as high as 6,000 lb. an hour. The smaller unit is a six truck model with a capacity of approximately 3,500 lb. an hour. Each truck holds about 700 lb. of products when loaded with 15 trays uniformly filled.

Semi-automatic in operation, the freezer operates by means of a conveyor belt which moves the food trucks through the freezing compartments. The first truck is pushed into the precooling chamber by hand and then moves forward automatically as the conveyor control button is pushed. Trucks are removed at the end of the process.

Rotary Pumps

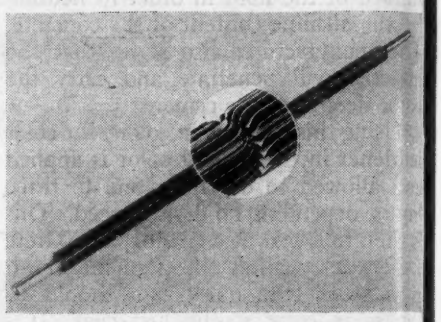
A SERIES of rotary pumps with antifriction bearings has been added to its line of standard units by Blackmer Pump Co., Grand Rapids 9, Mich. These pumps range from 10 to 750 gal. per minute at pressures up to 150 lb. per square inch. Advantages claimed for the new design are reduced power requirements and higher operating pressures. As the bearings are in contact with the liquid being pumped, these pumps are recommended only for handling viscous or non-viscous liquids having lubricating properties, such as oils and sirups.

Sealing Rings

B. F. GOODRICH Co., Akron, Ohio, is manufacturing jar sealing rings of non-critical materials for use in commercial food packing. These are of two types, one made of "Koroseal," a thermoplastic; the other a new linseed oil compound that can be vulcanized. The rings are for use in packing products that do not rate rubber rings, but for which fairly high priority rating for the use of substitute materials can be obtained.

Heat Exchanger Tubes

BROWN FINTUBE Co., 160 Filbert St., Elyria, Ohio, is now making "cut and twisted" fintubes. These are standard types of Brown longitudinal fintubes, with the fins cut transversely at desired intervals, and the cut ends twisted, as shown in the illustration. This is said to produce much greater turbulence of the fluid on the shell side than when straight, untwisted tubes are used. As a result, increased thermal efficiencies,



Cut and twisted fintubes for heat exchangers.

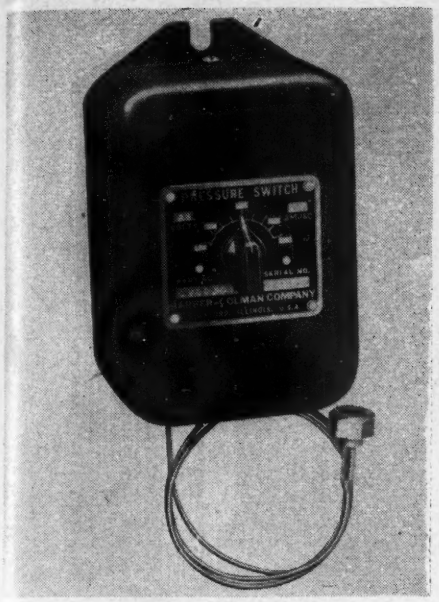
ranging up to 50 percent, are said to be produced in certain types of heat exchangers. In consequence, still further savings—in weight, pressure drop and other factors, are claimed.

Pressure Control Switch

BARBER-COLMAN Co., Rockford, Ill., recently developed the "Micro Pressure Switch" for proportioning control of motor-operated valves, power units, program switches and other devices for the regulation of steam, air and gas pressures. Among the applications of this switch are the control of the suction pressure of multiple Freon compressors, the regulation of head pressures in liquid level control, and the control of proportioning type fuel burners.

The device is a single-pole, double-throw, 3-wire instrument with position-

Sealing rings of non-critical materials, showing at the left a ring made of Koroseal, and at the right rings made from a vulcanizable linseed oil compound.



Pressure switch for proportioning control.

ing solenoid, and a pressure sensitive bellows mechanism, all mounted on a Bakelite sub-base and enclosed in a metal case for surface mounting. A built-in condenser protects the contacts. Convenient external adjustment is provided, but the setting may be locked in place by means of internal locking screws.

Steam-Jacketed Strainer

BLACKMER PUMP CO., Grand Rapids, Mich., has developed a strainer for handling highly viscous liquids or liquids that are solid at room temperature. The strainer is provided with a steam jacket to maintain the liquid at proper temperature for straining. It comes in capacities of 20, 50, 100 and 200 gal. per minute for pipe sizes of 1, 2 and 3 in. The 1-in. and 2-in. (50 gal. per minute) units have threaded pipe connections. The 2-in. (100 gal. per minute) and the 3-in. units have flange connections. Maximum operating pressure for the strainer is 50 lb. per-sq.in. at temperatures up to 300 deg. F. The steam jacket is suitable for 125 lb. steam pressure. The bottom and sides of the unit are completely inclosed in the steam jacket. Two inlet and outlet ports are provided for steam line connection.

Dehydrater Heater

RIGGS & LOMBARD, INC., Lowell, Mass., has developed a new type of heating coil for its "Fleet Line" dehydraters. This heater is made up of return bend coils with the bend floating at the top. The construction eliminates the stresses and strains of expansion and contraction, thus reducing upkeep. The coils are fastened at the bottom with standard flared tube fittings. Thus each individual

NOTE:
Baker has re-designed many of its trucks to meet Industry's needs for increased production:
1. Longer continuous operation
2. Faster handling of material
3. Lower maintenance

• The same advantages which have been designed into these trucks to speed the production of war goods also apply to normal peacetime material handling. The model illustrated, designated as Type H-3, is of 6,000 lb. capacity.

Improvements include a new hydraulic lift system which provides efficient, positive control of hoisting and lowering, increased battery compartment permitting longer continuous operation, operator's guard integral with frame for greater strength and safety, and other features which provide increased efficiency and easier maintenance ...The new improved design is also available in 4,000 lb. capacity. (Type H-2.)

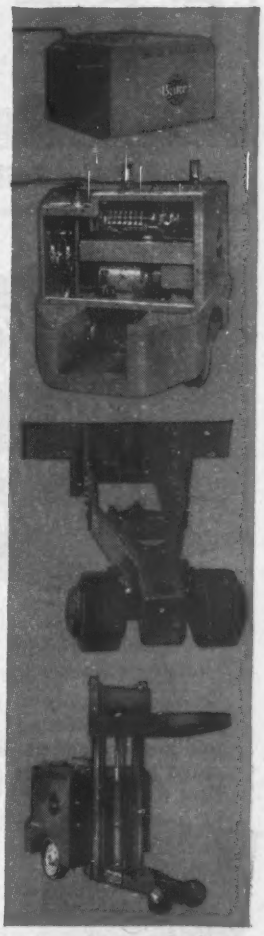
FOR INCREASED PRODUCTION AND EFFICIENCY

Larger battery box (32" x 39½") permits capacity to operate trucks continuously on longer shifts. Chamfered front top corner of battery compartment provides greater visibility for the driver. Sliding type battery cover is equipped with handles for faster servicing.

Controller, contactors, lift motor and pump are grouped together in a convenient control panel. Travel brake is easily adjusted by a single hex nut. Operator's guard built integral with frame for greater strength, provides handy compartment for carrying towing chain, pinch bar, or other tools

Easy steering results from proper design and anti-friction bearings on king pins. All steering levers and rods are inside frame, protected against damage. Frame members are fabricated of heavy plate by hot riveting and arc welding.

Efficient hydraulic lift provides power lifting and gravity lowering, under absolute control at all times. 67" lift for two or three high tiering is standard.



Write for complete information

BAKER INDUSTRIAL TRUCK DIVISION of the Baker-Raulang Company
2146 WEST 25th STREET • • • • CLEVELAND, OHIO
In Canada: Railway and Power Engineering Corporation, Ltd.
1211-1A-43

The STEINLITE is FAST ACCURATE and EASY to USE

In the thoroughly up-to-date production control of food dehydration, the Steinlite Moisture Tester is widely used.

It is remarkably FAST. Experienced operators can make a test in about one minute. If not experienced, an operator can make test in 2 or 3 minutes . . . . a tremendous saving compared to old moisture testing methods. The Steinlite is ACCURATE . . . . manufactured by expert radio engineers and technicians . . . . calibrated against official Government oven methods. The Steinlite is EASY TO USE . . . . almost as easy as a radio. Simply weigh out sample, pour it into hopper, press a button and compare the meter reading with a conversion chart.

The Special 40 gr. Steinlite . . . one-minute moisture tester.

The Steinlite is operated on the radio frequency impedance principle. Sold on FREE Trial; no deposit; prompt shipments. Write for catalog #143.

"HEADQUARTERS" for Moisture Testers, and all Grain Testing Equipment.

SEEDBURO EQUIPMENT COMPANY

Formerly SEED TRADE REPORTING BUREAU — FOUNDED 1912

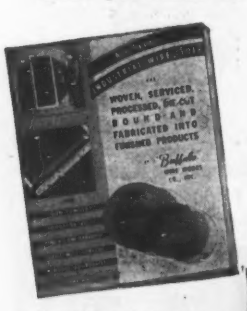
634 Brooks Building — **Chicago 6, Illinois**

"Buffalo" Wire Cloth Is Shipped READY FOR PRODUCTIVE USE

FINISHED TO YOUR SPECIFICATIONS FABRICATED INTO COMPLETED PRODUCTS

Strainers, baskets, filters, screens — hundreds of varieties — are moving through the "Buffalo Wire" plant. Close tolerances, accurate sizes, difficult shapes—such are the specifications demanded for tanks, ships and planes.

To a large group of America's war industries—synthetic rubber, chemical, process, oil refining, powder, abrasives—"Buffalo Wire" is delivering wire and metal products **ready for productive use.** No doubt your plant, too, can make profitable use of these broad services:



TRIMMING, SLITTING, CUTTING to accurate dimensions

BINDING with webbing, sheet metal edging

DIE-CUTTING shapes and circles

SOLDERING several types of cloth into one panel

SHAPING forms of various depths

WELDING FABRICATION on all types and weights of materials

Complete details in FOLDER 594-BC
A free copy belongs in your files.

DOING BUSINESS FROM COAST TO COAST FOR 74 YEARS

Buffalo WIRE WORKS CO., INC.

ESTABLISHED 1849 AS SCHEELER'S SONS

452 TERRACE — **BUFFALO 2, N. Y.**

Heater coil for dehydrater.

coil can be removed for repairs, the holes can be plugged, and the heater can still be used.

Wartime Paints

DEVELOPED to replace its line of "Wax-Fortified" paint during wartime, S. C. Johnson & Son, Inc., Racine, Wis., has brought out a new line of "War Formula" paints and enamels. These paints do not contain wax, but the makers state that they are made from the finest materials available at the present time. They require no special preparation or care in application and can be applied by brush or spray.

Available in this line are mill white flat or gloss enamel; commercial interior gloss (enamel) in 17 colors, black and white; commercial interior semi-gloss (enamel) in 10 colors and white; commercial interior flat in 10 colors and white; dado enamel in brown and gray; machine enamel in two colors and white; primer; undercoat; and thinner.

Waterproof Sealing Tape

MCLAURIN-JONES CO., Brookfield, Mass., is producing "Solseal" waterproof tape for sealing cartons and other shipping containers. The tape is applied in the same way as regular sealing tapes, using the same type of moistening dispenser, but employing a special solvent as the moistening agent. This solvent is a non-inflammable, non-volatile, non-corrosive mixture of chemicals that will, upon wetting "Solseal," cause it to become waterproof after a 72-hour period. It is claimed that bondings made with "Solseal" tape, immersed in water under strain, have withstood that immersion in some cases for as much as eight

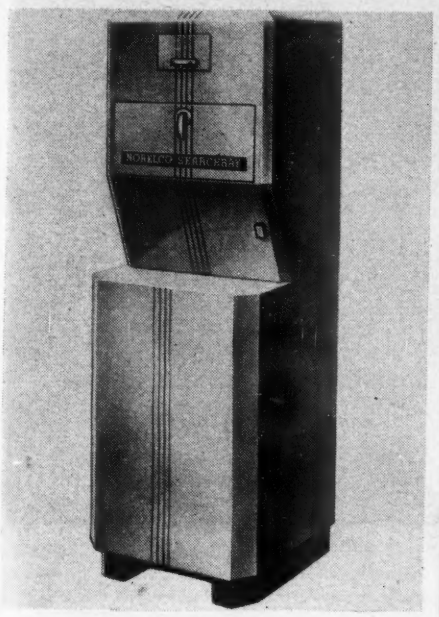
weeks, without any releasing of the tape. Tests made at temperatures from −25 deg. F. to 180 deg. F. have shown no injury to the bond.

"Solseal" is available in 30/30/30, 60/30/30 and 60 lb. wet strength kraft with "Solseal" adhesive, also string-filled for use as a strapping tape.

X-Ray for Foods

NORTH AMERICAN PHILIPS CO., 419 Fourth Ave., New York, has brought out "Searchray," an X-ray apparatus for fluoroscopic and radiographic examination of foods and other products. Designed to be safe, simple, and easy to operate, the device plugs in to any standard 110 volt a.c. power source.

In use, the compartment door is



X-ray apparatus for examining foods.

opened, the object to be examined is inserted, and the door is then closed. To view the internal structure of the object, the operator next pushes the button and looks through the eye-level eyepiece.

Safety is assured by a rayproof, shockproof housing. The door is electrically interlocked, so that the circuit is interrupted whenever the examining compartment door is opened.

Extruded Rubber Tubing

B. F. GOODRICH CO., Akron, Ohio, is now making an extruded rubber tubing suitable for use in food handling. A feature of this tubing is its extremely smooth inside bore, which eliminates the danger of food clinging to the inside surfaces and permits easy cleaning. This tubing is also said to hold its shape after severe usage. It is manufactured in sizes from $\frac{1}{16}$ to $\frac{3}{8}$ in. inside diameter, with wall thicknesses from $\frac{1}{8}$ to $\frac{5}{16}$ in. The only color available is black.

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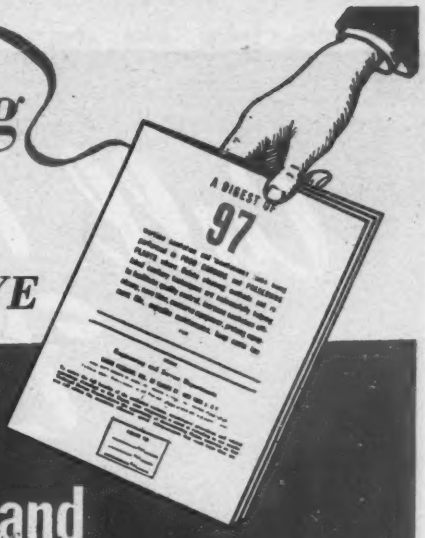

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describes* 97 *sanitation and maintenance jobs where Oakite cleaning materials expedite quality control, save man-hours, step up efficiency, and make equipment last longer!

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- Peeling Machines
- Mixing Vats, Storage Tanks
- Dehydrating Trays, Conveyors
- Kettles, Cookers, Retorts
- Juice Extractors and Pulpers
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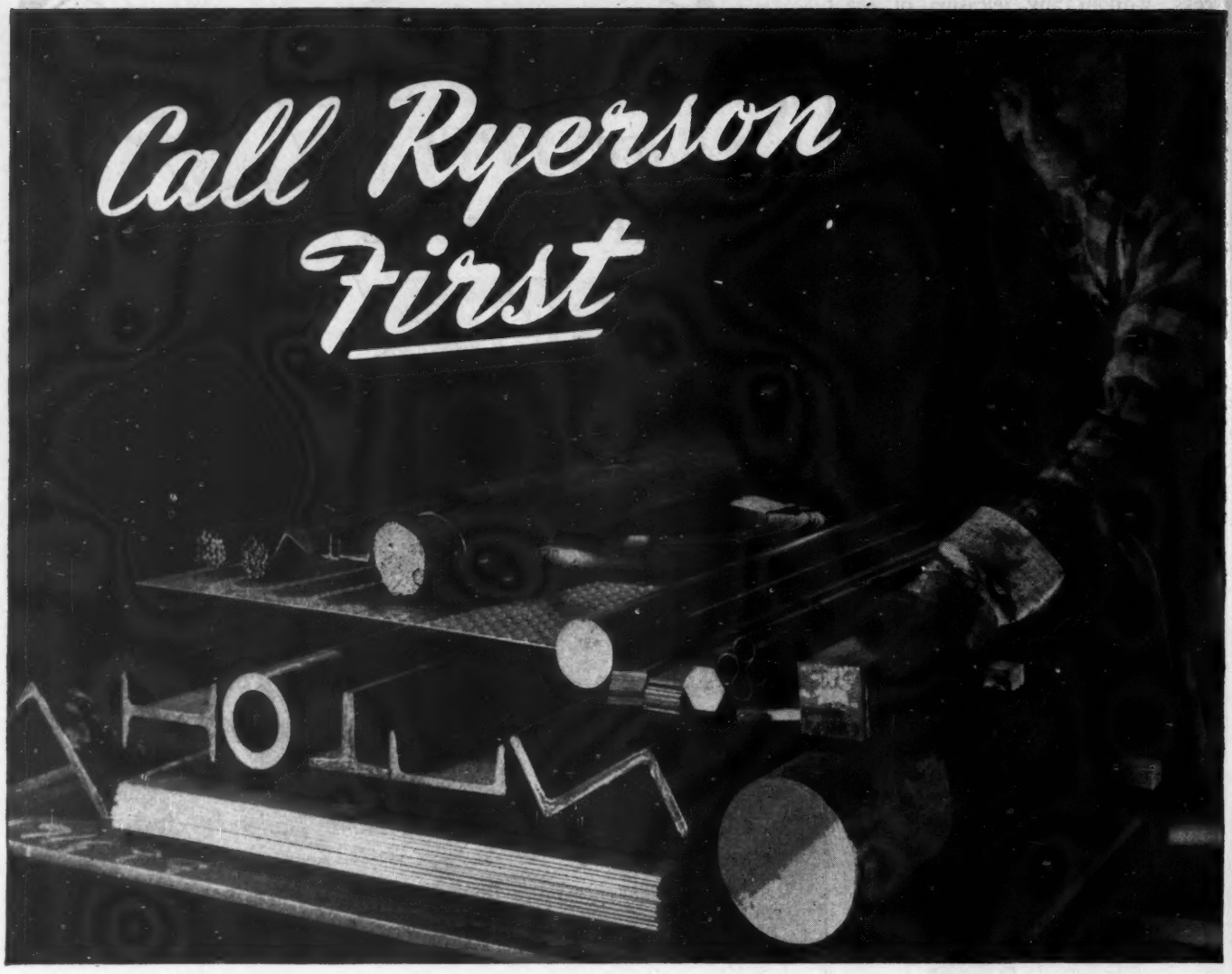

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FOOD PLANT EQUIPMENT

Belt Conveyors—Conveyor installation pictures, descriptions of belt idlers, engineering data and diagrams of hand, self-propelled and automatic belt conveyors are given in a 20-page catalog, 1D-105, "Belt Conveyors by Continental," issued by Continental Gin Co., Industrial Division, Birmingham, Ala.

Dairy Equipment—"Equipment for the Dairy Industry" is the title of a 170-page illustrated catalog, containing photographs and information on dairy equipment and supplies such as can washers, holding tanks, presses, agitators and pasteurizers; issued by Damrow Brothers Co., 196-1 Western Ave., Fond du Lac, Wis.

Locker Plant Equipment—How "The New Vilter Frigid Blast Freezer," a medium-size freezing unit for use in locker plants, increases freezing capacity and reduces handling time and freezing costs as described in a 4-page bulletin published by Vilter Manufacturing Co., 2110 S. First St., Milwaukee 7, Wis.

Mixing Equipment—"Pneumix in Action," a 24-page booklet illustrating typical applications of air-motored agitators in such operations as the manufacture of riboflavin, preparing ice cream mixes, and stirring milk in tank trucks has been published by Eclipse Air Brush Co., Inc., 390 Park Ave., Newark, N. J.

Overhead Handling Equipment—Numerous advantages, photographs and illustrations of American Monorail carriers for use in handling bulk materials, in food plants, in other industries, and in shipping, are found in a 56-page catalog issued by American Monorail Co., 13107 Athens Ave., Cleveland 7, Ohio.

PLANT SUPPLIES

Gas Masks—A gas mask which offers protection against toxic smokes, fumes and gases is described and illustrated in a brief bulletin published by American-La France-Foamite Corp., Elmira, N. Y.

Heating Equipment—A specification sheet, describing blower-type heat diffusers designed to heat and ventilate large areas both uniformly and economically, has recently been issued by Carrier Corp., Syracuse, N. Y.

Motors and Generators—Squirrel cage, direct-current and shipboard motors and shipboard auxiliary generators are described and illustrated in four short bulletins, forms SCF-1, 2, 102 and 101, respectively, published by Crocker-Wheeler Electric Mfg. Co., Distribution Engineering Department, Ampere, N. J.

Screws—Two price lists, Bulletins 849 and 850, giving prices of Bristol multiple spline and hex socket screws, respectively, have been issued by Bristol Co., Mill Supply Division, Waterbury, Conn.

Steel Belt Lacing—A 4-page folder giving prices, sizes and descriptive information about steel belt lacing has been published as Bulletin 773, by Bristol Co., Mill Supply Division, Waterbury, Conn.

Water Softeners—Many uses and applications of carbonaceous zeolite water softeners in boiler feedwater supplies are given in Bulletin 4021 issued by Cochrane Corp., 17th & Allegheny Ave., Philadelphia, 32, Pa.

CONTROL EQUIPMENT

Blancher Control—Automatic control systems applied to three types of blanchers—hot water, atmospheric steam and pressure steam blanchers—preparatory to dehydrating, freezing or canning of vegetables are described and illustrated through diagrams in an 8-page Bulletin No. F-M-1 entitled "Brown Automatic Control of Vegetable Blanching" issued by Brown Instrument Co., Wayne & Roberts Aves., Philadelphia 44, Pa.

Control Equipment—Bulletin A-330, a 16-page booklet, giving photographs and construction and operation details of Model 30 Stabilog Controller with hyper-reset action has been issued by Foxboro Co., Foxboro, Mass.

Dehydration Control—A brief resume of the essential factors in dehydration and diagrams of three types of dehydrators, together with discussions of control for dehydration, are given in a 4-page pamphlet, Bulletin No. 98163, "Taylor Control Systems for Food Dehydration," published by Taylor Instrument Cos., P. O. Box 110, Rochester 1, N. Y.

Level Control—Operation details, typical applications and dimensions of various types of Photoswitch Electronic Level Controls are found in a brief 4-page pamphlet, Sheet 1100, issued by Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.

pH Control—The development and application of pH, chlorine and phosphate control methods are described in a 84-page catalog entitled "Modern pH and Chlorine Control" issued by W. A. Taylor & Co., 7300 York Road, Baltimore 4, Md.

Temperature Control—Pictures and operation details of industrial temperature equipment within the range of −100 to +1,000 deg. F., and with an accuracy as great as ±0.1 deg. F., are given in Bulletin 2122, published by American Instrument Co., 8010-8020 Georgia Ave., Silver Spring, Md.

MISCELLANEOUS

Blended Shortening—An 18-page booklet giving a brief description of blended shortening, a table comparing its qualities to vegetable shortening and many household recipes, has been published by Swift & Co., Union Stockyards, Chicago.

Fan Maintenance—"Maintenance and Installation Data," a pocket-size 20-page booklet describing in detail how to install and maintain industrial fans and air conditioning equipment, has been published by Buffalo Forge Co., 181 Mortimer St., Buffalo, N. Y.

Feed Water Treatment—Publication 4008, entitled "Boiler Feed Water Conditioning and Chemistry," discussing the most common processes used in feed water conditioning, including the characteristics of the hot process water softener, zeolite softener and the removal of gases from boiler feed water; has been published by Cochrane Corp., 17th & Allegheny Ave., Philadelphia 44, Pa.

Flavors—A wholesale price list of essential oils, citrus concentrates, aromatic chemicals and other flavors has been published by Fritzsche Brothers, Inc., Port Authority Commerce Bldg., 76 9th Ave., New York.

Floors—Installed in aircraft plants for Boeing, Consolidated and other war plants, a light-reflecting floor built of concrete and made with white portland cement instead of gray is described in a 25-page catalog, "Light From Floors, Speeds War Production," published by Universal Atlas Cement Co., 135 E. 42nd St., New York.

Salting—A 16-page reprint of articles on "Preserving Vegetables by Salting," by F. W. Fabian and H. B. Blum, which discusses various methods of preserving vegetables by salting, has been issued by Diamond Crystal Salt Co., Inc., St. Clair, Mich.

Valve Maintenance—A folder describing "Economy Renewable Seats & Re-Seating Tools" for maintaining valves, faucets and bibbs has been put out by Economy Valve Seat Co., 2617-25 Fletcher St., Chicago.

War Posters—To help combat waste and stimulate worker morale, two continuous series of posters, 18x25 in., have been put out by Continental Can Co., 100 E. 42nd St., New York.

Model Food Plant

(Continued from page 59)

than the input, thus a positive pressure is maintained in the interest of conservation of refrigeration in the center room, where sausage meats are made and stuffed. Opposite the silent cutters, next to the finished-products refrigerator wall, a "flake ice" machine is provided to furnish ice for cooling meat in the silent cutter. The grinder, silent cutter, vacuum mixer and stuffers are of the latest improved sanitary type having no dead-ends, threaded holes, open seams in the product zone or parts inaccessible for cleaning. The grinder has the approved drain flange in the shaft housing and the vacuum mixer has a sanitary clean-out clearance on the end paddles near the hub.

The second floor has a dry storage room for spices, cereals, powdered milk, cellulose casings, paper stock and other materials. A similar room adjoining the dry storage room is used by the production man as an office in which to keep production records and necessary materials, tools and parts and conduct simple control tests. There is space in this room for the Federal inspector's locker.

This floor is interconnected with the upper floor of the garage building, which houses a route men's room or office, male locker and dressing rooms, shower and toilet, and a female dressing and locker room and toilet. The rear of this floor of the garage building is for general office use.

The Cellar

The cellar floor, walls and lighting are the same as those of the upper stories. The cellar is used for all wet operations, including the pumping and curing of meat, the washing and flushing of casings, and the washing of smoke trees, trucks, ham molds, bacon boxes and other equipment. There are two refrigerators. A sharp freezer and a holding freezer are provided, and three batteries each of ten vats. The class preferred vats of stainless steel having rounded corners. The edges are to be reinforced by an outside bend forming an arc not more than 180 deg. Space is reserved for storing and stacking belly boxes during bacon curing.

Sanitary stainless steel tables are located near each chute opening for the examination of meat cuts, sorting, grading and weighing. At the casing room wall, two pumping tables are provided. These are convenient to an air compressor and a brine supply, the brine being furnished in adequate quantity by a continuous and automatic salt dissolving and filtering device. Lard made in the room above flows down through sanitary piping to a filling station in the cellar. The temperature of the room is sufficient for chilling.

Scales have been omitted from this discussion because there was such a wide divergence of opinion as to the best type of floor scales and the most suitable manner and arrangement of smaller scales in the various processing departments. It was felt that the decision as to weighing devices was so closely connected with individual ideas and methods of control that no general suggestion can be advanced for this type of installation.

The class was careful to specify construction of rat-proof nature. All floors and walls, especially in the refrigerators, were to be tied in by heavy-gage metal lath. No double walls or enclosed spaces were to be tolerated in the ceiling or under equipment or lockers. All doors were to be tight fitting and edged with metal at least 6 in. from the floor. Flaps over the refrigerator wall openings which accommodate the overhead rails were to be installed with no greater than ¼ in. clearance on either side of the rail.

All fixed equipment was to be installed at least 2 ft. from the wall or other equipment. Wherever practical, this equipment was to be mounted on legs, preferably with ball bottoms.

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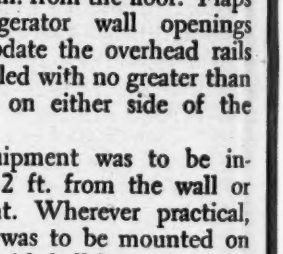

PROCESSING plants that have the problem of feeding dry, powdered, granular or flaked essential materials from storage bins or hoppers to various production machines, will do well to investigate DRAVER FEEDERS! By feeding a continuous flow of materials at the desired capacity, a Draver insures maximum efficiency—no dangerous overloading—no machines running at less than full capacity. Positive, easily controlled regulation provides required accuracy. More than 100 sizes and models. Also for continuous mixing systems.

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All hose lines were to be provided with vacuum breakers to prevent water contamination by back siphonage, and equipped with suitable racks to prevent their lying around on floors when not in use. All faucets for the utility sinks and wash basins were to be installed above the rim level of the sink. Water supply lines for the cookers were to be located well above the rim of the cooker. The bologna cooker chosen was to be one which supplies fresh clean hot water and not of the recirculating type. The water supply is to be protected by a vacuum breaker on this device because it is a closed system.

The curing vats are to discharge over a valley drain. The flushing nozzles on the casing table are to be protected by vacuum breakers, as is the water connection to the automatic brine machine. There are two sanitary type angle spout bubblers provided on each floor.

The ventilation of the toilets on the first floor and in the cellar is to be by mechanical means. The toilets on the second floor and in the delivery office ventilate by means of a window.

Infrared Dehydration

(*Continued from page 79*)

tained is insufficient for proper design of a large oven, a rough approximation of an actual oven for dehydrating carrots is given. As a basis of computation, an oven containing 850 of the 250-watt reflector lamps is used. The oven would be approximately 40 ft. long, and a useful conveyor width of about 3.5 ft. could be employed. If carrots containing 87 percent moisture were cut in ½-in. slices, approximately 11 minutes would be required to remove over 90 percent of the original moisture. The conveyor speed would then be about 3.5 ft. per minute. On the basis of 2 sq.ft. per pound of carrot, the capacity of the oven would be approximately 225 lb. of wet material per hour. While these computations are not exact, it is believed that they are conservative.

The authors wish to express their appreciation to Howard Haynes and W. C. Brown of the Nela Park Engineering Department of the General Electric Company for furnishing the lamps used in this investigation.

References

1. W. L. Badger and W. L. McCabe, "Elements of Chemical Engineering," p. 300. McGraw-Hill Book Co., New York, 1936.
2. P. H. Goodell, American Institute of Electrical Engineers, Technical Paper 40-156, 1940.
3. Howard Haynes and R. L. Oetting, General Electric Co., Nela Park Engineering Department, Bulletin LD-16, 1941.
4. H. R. Kraybill, *Industrial and Engineering Chemistry*, vol. 35, p. 46, 1943.
5. F. M. Tiller and H. J. Garber, *Industrial and Engineering Chemistry*, vol. 34, p. 773, 1942.

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BOOKS

Advertising Successes

THE BLUE BOOK. Published by the Bureau of Advertising, American Newspaper Publishers Association, 370 Lexington Ave., New York, N. Y., 1943. 154 pages; 9¾x12 in.; paper. Free.

Those top executives of food companies who among their other duties, take a hand in shaping the advertising approach made to the public will find some practical and stimulating material in this book. The publication is devoted to case histories of wartime advertising successes, including 16 in the food and grocery field among a total of 69 selected as the most successful newspaper advertising campaigns in 1943. Canners, fruit growers organizations, fish packers, bakers, a dairy, a cereal manufacturer, a bottler and a specialty food manufacturer are represented.

In discussing each campaign, the book reproduces some of the advertisements and then explains the purpose the campaign was designed to accomplish, the technic employed and the results obtained. American Cranberry Exchange, for example, had the problem of marketing a record cranberry crop in the face of the wartime shortage of the sugar normally required in large quantities in connection with all uses of cranberries. The problem was solved by featuring sugar-saving recipes for cranberry dishes, the advertisements being published in 201 newspapers in 185 cities, supplemented by space in Sunday magazine sections. And this was the result—the cranberry crop was sold out.

While the material in this book is factual, it pertains only to newspaper advertising and does not give the executive any information about campaigns in the other media. The basic ideas represented, however, usually could be applied to advertising in magazines and on the radio, and even at point of sale.

Fats and Oils Figures

ANIMAL AND VEGETABLE FATS AND OILS. Published by the Bureau of Census, U. S. Department of Commerce, Washington, D. C., 1943. 28 pages; 6x9 in.; paper. Price, 10 cents; for sale by the Superintendent of Documents, Washington, D. C.

This is a statistical picture of the supply and consumption from 1938 to 1942 of fats and oils, which have become a critical class of materials for food manufacturers under wartime conditions. It is a very dry picture, the statistics being neither summarized nor interpreted, but the facts are there.

The figures show that factory production has decreased for crude and refined cottonseed oils, crude and virgin peanut oil, crude and refined coconut oils, refined palm kernel oil, refined palm oil and refined babassu oil. But production has increased for refined peanut oil, crude and refined corn oil, crude and refined soybean oils, edible olive oil, crude babassu oil, linseed oil, and castor oil, the increases being large for the corn, soybean and linseed oils. Fish oil production has dropped, but there were important increases in lard and tallow. Production of shortening has decreased, but the output of hydrogenated oils is way up. The production of oleo oil is much higher, and also that of glycerine. There were increases, too, in the production of stearin, lard oil, tallow oil, red oil, stearic acid and vegetable oil foots.

Figures are also given for stocks, oilseed imports, raw materials used in producing vegetable oils, imports and exports. Pie charts show the relative consumption of fats and oils.

Index to Food Studies

INDEX TO THE LITERATURE OF FOOD INVESTIGATION, Vol. 14 No. 2. Published by His Majesty's Stationery Office, London, England, 1942. 149 Pages; 6x9¼ in.; paper. Price, $1.35; for sale by the British Information Services, 30 Rockefeller Plaza, New York, N. Y.

While this index was published in 1942, it has only recently been put on sale in this country. It is valuable to food technologists and engineers, not only because it gives references to the world's literature on food technology (insofar as is possible under wartime conditions), but it gives brief digests of each article cited. The index covers meat; poultry and game; fish; eggs; dairy products; fats and oils; fruits and vegetables; grain products; theory of canning, freezing and chilling; bacteriology; and engineering.

List of Patents

LIST OF UNITED STATES, BRITISH AND GERMAN PATENTS COVERING THE MANUFACTURE OF DRIED, DESICCATED, AND DEHYDRATED FOOD PRODUCTS. Published by D. Steinherz, 103 Park Ave., New York, N. Y., 1943. 140 pages; 8½x13¾ in.; paper. Price, $25.

A complete chronological, but not indexed, list of United States, British and German patents from as far back as 1780 and up to January 1, 1943, on dried, dehydrated and desiccated foods may be found in this book. The patent number, date of issuance, patentee and a short paragraph about each patent are given.

PATENTS

Materials Given Spray Coating of Fortifying Nutrients During Passage Over Vibrating Table in Uniform Layer and Subsequently Dried and Discharged at Controlled Rate—Fredus N. Peters, Evanston, Ill., to Quaker Oats Co., Chicago, Ill. No. 2,324,874. July 20, 1943.

Foods Dehydrated by Treatment in Suspended State in Stream of Hot Oxygen Free Gas—Henry Randel Dickinson, Grand Rapids, Mich., and Henry H. Moreton, East Orange, N. J. No. 2,324,914. July 20, 1943.

Solids Separated From Liquids by Centrifugal Action and Discharged Peripherally From Centrifuge During Rotation of Rotor—Leo D. Jones, to Sharples Corp., Philadelphia, Pa. No. 2,324,933. July 20, 1943.

Citrus Fruit Kept in Substantially Fresh and Relatively Homogeneous Condition During Nonturbulent Movement for Deaeration by Maintenance of Temperature of about 32 to 34 Deg. F.—Frank H. Collins, Orange, Calif., to California Fruit Growers Exchange, Los Angeles, Calif. No. 2,325,111. July 27, 1943.

Food Articles in Cylindrical Form Package Wrapped in Unwaxed Paper Strip Superimposed Upon Waxed Paper Strip and Closed by Tucking in End of Wrapper, With Tearing Strip Projecting From End of Wrapper—William T. Martin, to Beechnut Packing Co., Canajoharie, N. Y. No. 2,325,145. July 27, 1943.

Cheese Curds Soaked in Solution of Edible Acid to Raise Acidity to Approximately Between 4.8 and 5.2 pH—William O. Beers, Kendallville, Ind., to Kraft Cheese Co., Chicago, Ill. No. 2,325,217. July 27, 1943.

Corn Starch Separated From Gluten by Series of Centrifugal Operations in Which Underflow Moves in One Direction From One Centrifugal to Another With Overflow in Opposite Direction—Alfred H. Kelling, Oak Park, Ill., to Corn Products Refining Co., New York, N. Y. No. 2,325,250. July 27, 1943.

Acid Fruit or Vegetable Juices Deaerated, Treated to Pasteurizing Temperature, Treated While Hot in Container With Carbonate, Sealed and Cooled to Have Carbon Dioxide Content Substantially the Same as Original Juice Exposed to Ordinary Room Conditions—Samuel H. Ayers and David L. Loetscher, to Crown Can Co., Philadelphia, Pa. No. 2,325,360. July 27, 1943.

Tea Leaves Exposed to Ultraviolet for Reduction in Tannin Content Without Substantially Affecting Other Normal Characteristics—Fanet O. H. Chutjian, New York, N. Y. No. 2,325,370. July 27, 1943.

Solid Fat Mechanically Mixed With Water to Form Plastic Mass Preliminary to Addition of Glyceride Oil and Continuous Working to Form Homogeneous Mass Packaged as Margarine and Cooking Fat—John Edward Green, Stretford, Manchester, England, to Co-operative Wholesale Society, Ltd., Manchester, England. No. 2,325,393. July 27, 1943.

Sausages Stuffed Into Casings Through Nozzle Provided With Plurality of Longitudinal Slots—Charles T. Walker, to Industrial Patents Corp., Chicago, Ill. No. 2,325,446. July 27, 1943.

Peas Shelled by Passage Through Superimposed Pod-squeezing Rollers—Henry William Hastwell, Hobart, Tasmania, Australia. No. 2,325,509. July 27, 1943.

Ice Cream Mix Subjected to Vacuum Pasteurization and Deodorization Without Caramelization of Sugar but With Reduction of Viscosity and Acidity of Mix—Henry Lamont Murray, Epsom, Auckland, to Murray Deodorisers, Ltd., Auckland, New Zealand. No. 2,325,534. July 27, 1943.

Cheese and Similar Products Packaged in Container to Which Telescopic Cover is Fitted by Mechanical Means—Arthur B. Erekson, Plymouth, Wis., to Borden Co., New York, N. Y. No. 2,325,670. Aug. 3, 1943.

Raw Ground Coffee Roasted in Small Quantities Immediately Preceding Brewing—Gustave L. Kayden, Woodmere, N. Y. Nos. 2,325,683 and 2,325,684. Aug. 3, 1943.

Sausages Linked Into Uniform Predetermined Lengths by Mechanical Means—Joseph Haag, New York, N. Y., two-thirds to Julian J. Wittal, New York, N. Y. No. 2,325,769. Aug. 3, 1943.

Juices Extracted in Unit Equipped with Spiral Feed, Rotary Shredding Knife Having Plurality of Upstruck Teeth and Centrifugal Strainer Into Which Shredded Vegetables Are Hurled by Knife—Frank J. Kraber, Los Angeles, Calif. No. 2,325,779. Aug. 3, 1943.

Fresh Fruit Covered With Tacky, Surface-adhering Material Washed and Handled on Endless Roller Conveyor—Howard L. Porch, Riverside, Calif., to Food Machinery Corp., San Jose, Calif. No. 2,325,919. Aug. 3, 1943.

Butter and Similar Plastic Edibles Cut Into Predetermined Sizes and Shapes and Embossed by Mechanical Means—Charles Doering, Chicago, Ill. No. 2,326,016. Aug. 3, 1943.

Sausage in Natural Casing Identified by Imprinted Strip or Ribbon Fed Into Casing Along With Meat at Time of Stuffing, Caused to Adhere to Casing and Become Invisible as Strip During Curing—Charles T. Walter, to Industrial Patents Corp., Chicago, Ill. No. 2,326,082. Aug. 3, 1943.

Coffee Roasted in Vertical Unit Equipped With Thermostatic Control Regulating Opening and Closing of Feed and Discharge Doors as Well as Roasting Temperature—Charles E. Cusack and Hans H. Berger, to McCass Co., Los Angeles, Calif. No. 2,326,094. Aug. 3, 1943.

Potatoes Dried at Lower-than-cooking Temperatures During Continuous Passage Through Heated-air Tunnel to Prevent Soft Rot—Alexander F. Arthur, Homestead, Fla., to Frederick C. Peters, Miami Beach, Fla. No. 2,326,115. Aug. 10, 1943.

Milk Treated With Calcium or Magnesium Oxide to give pH Between 6.6 and 7.4 Preparatory to Making of Cheese—Ernest D. Fear; 30 Percent to Irving E. Fear and 20 Percent to Helendoris Murphy, Kansas City, Mo. Nos. 2,326,132 and 2,326,133. Aug. 10, 1943.

Bakery Doughs Leavened by Impregnation With Carbon Dioxide Under Pressure of 20 to 60 lb. at 60 to 90 Deg. F. Preparatory to Immediate Baking—Jacob Freilich, Bronx, and Charles N. Frey, Scarsdale, to Standard Brands, Inc., New York, N. Y. No. 2,326,134. Aug. 10, 1943.

Liquids Concentrated in Two Stages by Spraying Into Spirally Moving Current of Heated Air With Reuse of Part of Heated Air From First Stage in Second Stage—Joseph M. Hall, Chicago, Ill., to Drying & Concentrating Co. No. 2,326,142. Aug. 10, 1943.

Fish Mechanically Positioned for Packing Into Cans—Karl Kurzbin, Monterey, Calif. No. 2,326,146. Aug. 10, 1943.

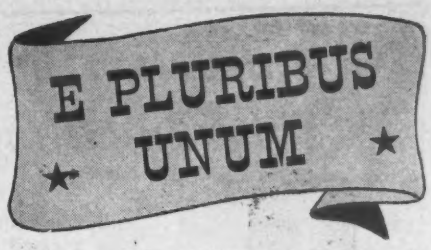
Alkali-soluble Protein Recovered From Oil-free, Water-soluble, Protein-free Cottonseed Meal by Extraction; Subsequently Subjected to Carbon Dioxide Bubbling for Precipitation—Lawrence W. Bass and Harold S. Olcott, Pittsburgh, Pa., to Cotton Research Foundation. No. 2,326,195. Aug. 10, 1943.

Bread Made from Dough Containing Small Quantities of Carbamide and Urease to Stimulate Yeast Activity and Reduce Carotin Coloring—John C. Baker, Montclair, N. J., to Standard Brands, Inc., New York, N. Y. No. 2,326,278. Aug. 10, 1943.

Vegetables Washed in Stationary Drum Fitted With Water Spray, Rotatable Plate for Supporting Vegetables, and Rotating Brushes—William Heywood Haslam, to Fisadco, Ltd., London, England. No. 2,326,356. Aug. 10, 1943.

Sugar Solution Refined Through Use of Bauxite Treated with Ammonia and Calcined at Between 500 and 1600 Deg. F.—William A. La Lande, Jr., Upper Darby, Pa., to Porocel Corp., Philadelphia, Pa. No. 2,326,369. Aug. 10, 1943.

Whole Grapes Subjected to Hydrolyzing Action of Sodium Hydroxide to Prevent Checking, Cracking, or Splitting of Grape Skin Pre-



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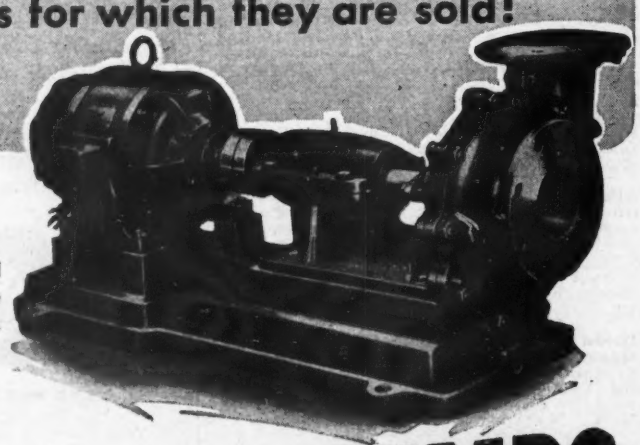

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liminary to Puncturing of Skin and Pulp for Impregnation of Grapes With Heated Sugar Sirup—Otto J. Steinwand, Oakland, Calif., to S & W Fine Foods, Inc., San Francisco, Calif. No. 2,326,407. Aug. 10, 1943.

Carbohydrate Mash Fermented by Butyl Alcohol-producing Bacteria to Give High Concentrates of Riboflavin—Cornelius P. Arzberger, Terre Haute, Ind., to Commercial Solvents Corp. No. 2,326,425. Aug. 10, 1943.

Seafoods Washed by Mechanical Means—Christy B. Nelson, Tokeland, Wash. No. 2,326,485. Aug. 10, 1943.

Milk Dried During Passage Over Series of Rolls Positioned in Vertical Relation to Each Other and Fitted to Give Alternate Zones of Heating and Cooling and Perforated to Give Aeration to Milk During Drying—Harry I. Andrews, South Norwalk, Conn. No. 2,326,512. Aug. 10, 1943.

Vitamin Extracted from Fish Oil Stearin to Give Product of Improved Color, Odor and Taste—Kenneth C. D. Hickman, to Distillation Products, Inc., Rochester, N. Y. No. 2,326,644. Aug. 10, 1943.

Carob Beans Dehusked by Treatment With 95 Percent Sulphuric Acid for 40 to 50 Min. at About 50 Deg. C.—Louis Amédée Lantz and Wadim Roman, to Calico Printers' Association, Ltd., Manchester, England. No. 2,326,868. Aug. 17, 1943.

Cream Containing 70 Percent or Higher Butter Fat Handled to Give Quick Cooling and Removal of Absorbed Air—Richard J. Speirs, Cameron, Wis., to Abbotts Dairies, Inc., Philadelphia, Pa. No. 2,327,140. Aug. 17, 1943.

Gelatinous Material Extracted From Stock by Soaking in Water Solution of Peptizing Agent at Normal Temperatures—Donald P. Grettie, to Industrial Patents Corp., Chicago, Ill. No. 2,327,185. Aug. 17, 1943.

Poultry Eviscerated by Mechanical Means—Joseph P. Spang, Quincy, Mass., to Cube Steak Machine Co., Boston, Mass. No. 2,327,224. Aug. 17, 1943.

Cocoa Bean Meats Converted Into Chocolate Liquor With Viscosity of About 30 Deg. McMichael by Cutting Action of Rapid Revolving Knives; Rapidly Moving Air Removes Vapor While Liquor is Produced—James F. McCashen, Bay Village, Ohio, to Rotary Cutters, Inc. Nos. 2,327,280 and 2,327,281. Aug. 17, 1943.

Canadian Patents

Glyceride Oils Freed From Free Fatty Acid Content by Neutralization With Nonvolatile, Nonsaponifying Agent in Excess Quantities and Separating by Difference in Specific Gravity—Benjamin Clayton, Houston, Tex., to Refining, Inc., Reno, Nev. No. 413,570. June 29, 1943.

Salmon Cut Cross Sectionally Into Steaks, Packed and Sealed in Container, Preparatory to Preservation by Cooking—Francis Millerd, Vancouver, British Columbia. No. 413,620. July 6, 1943.

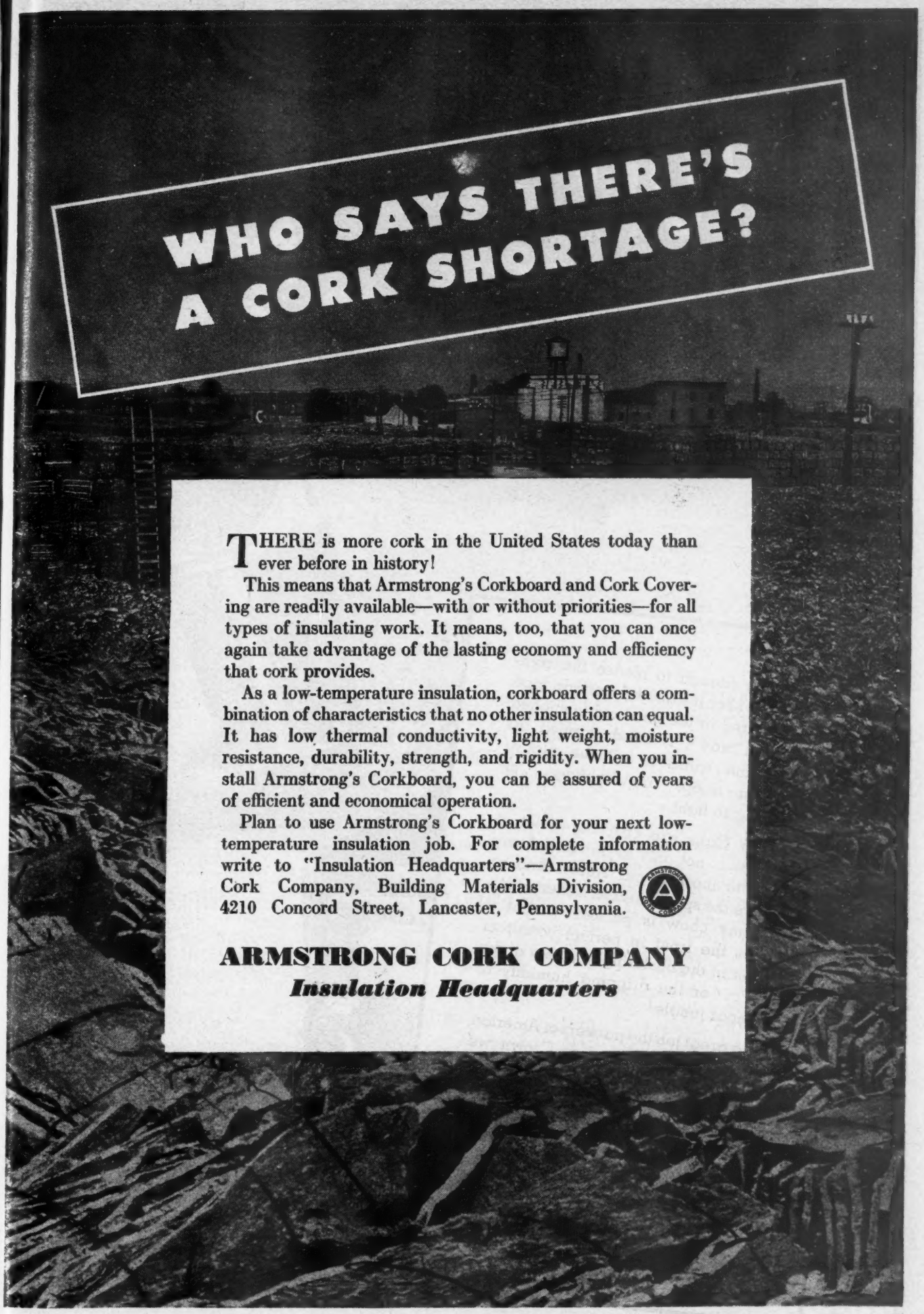
Meringue Composition Made to Contain Small Quantities of Calcium Lactate and Tartaric Acid—Verne D. Littlefield, Beverly Hills, Calif., to Armour & Co., Chicago, Ill. No. 413,802. July 13, 1943.

Juices Extracted by Centrifugal Action—Henry G. Schwarz, to Schwarz Engineering Co., Inc., San Francisco, Calif. No. 413,856. July 13, 1943.

Bottles Washed in Machine Equipped With Control Shoe Riding on Flexible Conveyor Which Automatically Stops Machine Upon Buckling of Conveyor—Frank P. Perkins, to Michael Yundt Co., Waukesha, Wis. No. 413,887. July 13, 1943.

Ice Cream Mix Pasteurized, Neutralized by Addition of Calcium Oxide or Magnesium Oxide, Homogenized, Inoculated With Lactic Acid Producing Starter to Give Acidity of About 0.1 Natls Preparatory to Freezing—Ernest D. Fear, to De-Raef Corp., Kansas City, Mo. No. 414,772. Aug. 24, 1943.

Preformed Units of Ice Cream and Similar Frozen Confections Subjected to Mechanical Cutting and Agitating Action to Give Plastic Consistency Without Decrease in Volume and to Impart Improved Taste and Texture Characteristics Immediately Preceding Transfer to Receptacle for Consumption—Russell Stover, Kansas City, Mo. Nos. 414,820 and 414,821. Aug. 31, 1943.



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FOOD TECHNOLOGY

NEW DISCOVERIES AND INVENTIONS

FATS AND OILS

Conservation of Fat

FRYING fat can be kept free of separated particles by the use of a recently patented deep-fat kettle so arranged that the heating element is in contact with a relatively shallow upper layer of the melted fat, on which the cooking foods float, and the circulation of the liquid medium is such that any detached particles are carried down into a cooler zone which consists of a deep annular well in the bottom of the kettle, at the base of the outer wall. The settled particles are periodically drained off from the annular well and discarded.

In the conventional doughnut kettle it is these detached particles which come into direct contact with the heating surface and so are continuously cooked and burned, darkening the fat and breaking it down, with formation of smoke and off flavors. Removal of these particles from the fat involves a considerable saving, since the fat remains clear and fresh for a long time and may be used in successive operations until it is all used up. The product is also more uniform in quality, due to the uniformity of the frying medium.

Digest of U. S. Patent 2,317,704, issued April 27, 1943, to P. K. Winter, Oakland, Calif.

STARCH CHEMISTRY

Maltose Determination

REDUCING dextrins occur in both acid- and enzyme-hydrolyzed starch products. These interfere in the chemical determination of maltose. Fehlings solution cannot be used to distinguish maltose or dextrose from other reducing substances.

Fleischmann enriched baker's yeast ferments the common sugars, dextrose, fructose, sucrose and maltose. A special yeast is available which ferments all of these sugars except maltose. Measured in terms of carbon dioxide evolved, the difference between the total sugars and the sugars fermented by the second yeast represents maltose. That part of the dextrin or starch subject to attack by β-amylase may be determined as the increase in fermentables obtained by adding a source of β-amylase to a baker's yeast fermentation.

Use of these specific analytical methods in following the course of an acid hydrolysis of starch indicates that the Rolfe and Defren curves for starch conversion are in error. A corrected curve, with a maximum value of 25.2 percent for maltose, is presented.

Digest from "Sugar Determination in Starch Hydrolyzates," by A. S. Schultz, R. A. Fisher, L. Atkin and C. N. Frey, *Industrial and Engineering Chemistry, Analytical Edition*, vol. 15, 496–98, August 15, 1943.

STORAGE

Ozone in Apple Storage

OZONE has been shown to decrease the number of apples rotting in storage, although it will not prevent rotting of punctured apples. As a fungicide for fruit storage, ozone has very definite advantages and limitations.

The author lists the advantages as absence of harmful residue, diffusion into inaccessible places such as the inside of boxes, effectiveness without gastight or sealed storage, destruction of deleterious odors, and absence of ill effect on persons entering storage rooms. As disadvantages are listed the instability of ozone, its destructive effect on rubber, its acceleration of the development of rancidity in fatty substances, its reduced effectiveness in the presence of organic matter, and the fact that the low concentrations required limit the rate of diffusion through liquids which have a considerable depth. The concentration is limited because at relatively high concentrations the ozone has a somewhat harmful effect on the fruit.

Digest of "Some Factors Influencing the Toxicity of Ozone To Fungi in Cold Storage," by R. D. Watson, *Refrigerating Engineering*, vol. 46, 103-6, August, 1943.

Frozen Poultry

NEW YORK dressed poultry, quick frozen in a brine spray within 5 hours after dressing and held as long as 6 months before eviscerating, was superior in palatability to birds eviscerated 18 hours after dressing, then disjointed, packaged, multiple-plate frozen, and held in storage for the same length of time. New York dressed birds which were chilled for 18 hours, then held in frozen storage at −5 deg. F. for the same time, were distinctly inferior to either of the other series. All birds held in storage as New York dressed poultry were disjointed, packaged and quick-frozen after eviscerating. Fresh controls, eviscerated and disjointed promptly, then held at 35 deg. F. for 15 to 23 hours, were in all cases superior to any of the frozen specimens.

Prompt quick freezing of New York dressed birds, to be eviscerated and refrozen at a later date, offers the possibility of running an eviscerating plant all year round, with greater economy than when all operations are confined to the four or five months of heavy marketing of poultry, as at present, and without loss of quality over present methods.

All of the frozen birds showed loss of juiciness, this loss being independent of the freezing method. The liver deteriorated rapidly when frozen, somesometimes being soft and mushy, and sometimes very hard and tough after cooking.

Digest from "Palatability Studies on Poultry: A Comparison of Three Methods for Handling Poultry Prior to Evisceration," by G. F. Stewart, H. L. Hanson and B. Lowe, *Food Research*, vol. 8, 202-11, May-June, 1943.

DEHYDRATION

Heat and Moisture Damage Dried Eggs

DETERIORATION of dried egg powder due to too high temperature may occur just after the powder has been removed from the drier, due to the high temperature of the powder when it is packaged and the extended cooling period in the packages, or the deterioration may take place because of elevated temperatures during storage and shipment.

Dried egg powder was held at temperatures between 80 and 140 deg. F. for periods of 3 hours to 7 days. The effect on quality was judged by fluorescence and other methods discussed in a previous article, abstracted in FOOD INDUSTRIES for August, 1943, page 127.

Commercial samples from both box type and cone driers were used. In both cases the inlet temperature was about 300 deg. F. and the outlet temperature 145 deg. F. Test samples were cooled immediately to 32 deg. F. and held in sealed containers at 32 to 40 deg. F. until heated for testing.

Deterioration was most rapid during the first day at 110 deg. F. and above, but some loss of quality could be detected after shorter periods and at lower temperatures. Definite indications of deterioration were present after 3 hours

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at 95 deg. F. There was little change at 80 deg. during this period.

Results of these tests led to the requirement that all Canadian egg powders for export to England be cooled to a temperature of 80 deg. F. or lower within one hour from the time of their formation.

Another series of tests confirmed the 5 percent limit on moisture established on the basis of practical experience, and indicated that values below 2 percent are desirable. Since at all temperatures from 45 to 110 deg. F. deterioration occurred in powder containing as little as 2 to 3 percent moisture, it appears that there is no limit of moisture commercially attainable at present below which deterioration can be prevented regardless of the temperature to which dried egg is exposed. The time required for egg powders to deteriorate to the lowest quality acceptable for export to England as first-grade powders was as follows, for moisture contents of 3, 5 and 7 percent, respectively: At a holding temperature of 45 deg. F., 3, 3, and 1.5 months; at 80 deg. F., 17, 12 and 6 days; at 110 deg. F., 46, 34 and 26 hours.

Digest from "Dried Whole Egg Powder. II, Effect of Heat Treatment on Quality" and "IV, Effect of Moisture Content on Keeping Quality", by W. Harold White and M. W. Thistle, *Canadian Journal of Research*, vol. D, 21, 194–202 and 211–222, July, 1943.

Multistage Drying

CLOSE and flexible control of air distribution, humidity, temperature and time, in a cabinet drier, are provided in a patented dehydration process. Dehydration is carried out in several stages, to avoid case-hardening, oxidation and other difficulties usually encountered with dehydrated products, and to preserve the cell structure, flavor and appearance of the product. The typical process involves an initial heating period at low heat and relatively high humidity, with slow air circulation, followed by three or more stages with more rapid air velocity and characterized successively by high heat and high humidity, medium heat and reduced humidity, and finally medium heat and low humidity.

In the examples given cherries are started at 150 deg. F., 30 percent relative humidity and slow fan for one-half hour, then raised to 190 deg. F., 30 percent humidity and full air velocity for 2 hours, followed by 170 deg. F. and 20 percent relative humidity for 1 hour, and finally 170 deg. F. and 15 percent relative humidity, still with full air velocity, for the balance of the drying time. Apples can be dried at a much higher temperature and with a shorter cycle.

Potatoes require lower temperatures. 150, 165, 160 and 150 deg. F. for the four periods, with the relative humidities 35, 35, 30 and 25 percent, respectively, and the times for the first three periods are one-quarter, one-quarter and one-half hour.

Suitable conditions for other fruits and vegetables are outlined.

The cabinet is so arranged that air can be recirculated or exhausted as desired. Automatic controls are operated by wet and dry bulb thermometers, and there is provision to control the amount of air going to each set of trays. The patent claims cover the process and not the apparatus.

Digest of U. S. Patent 2,318,027, issued May 4, 1943, to G. A. Sykes and A. L. Andrea, Sodus, N. Y.

DAIRY PRODUCTS

Vitamins in Cheese

VITAMINS of the B complex appear to be synthesized and stored in the outer portions of certain cheeses during the curing period. Relatively little change was found in the core portion, and the evidence suggests that production and storage of the B vitamins is related to metabolic activities of microorganisms growing in the exterior of the cheeses. Both yeasts and bacteria isolated from the various cheeses were grown as pure cultures on a basal medium in darkness, and the entire cultures were assayed for the vitamins. The range of vitamins synthesized was, in micrograms per gram of fresh organisms present in the cultures at the end of one week, riboflavin, 41 to 98; niacin 0 to 118, and biotin 0 to 2.46.

Thiamine, riboflavin, biotin and nicotinic acid were determined microbiologically. Cheeses tested were Camembert, Brie, Liederkranz and Limburger.

Digest from "Synthesis of Vitamins by Microorganisms in Relation to Vitamin Content of Fancy Cheeses," by P. R. Burkholder, J. Collier and D. Moyer, *Food Research*, vol. 8, 314-22, July-August, 1943.

Dried Skim Milk For Bakery Products

FERMENTATION may be retarded or loaf volume decreased by the use of dried skim milk which is not adapted to bakery requirements. To avoid this, skim milk is modified prior to drying by the addition of a small proportion of skim milk in which the protein has been completely digested by a proteolytic enzyme.

Normal skim milk is subjected to the action of a hydrolytic proteolytic enzyme, such as papain or bromelin, until the proteins are completely digested and the solution is yellowish green, substantially free from turbidity. The enzymes

are then destroyed or inactivated by heating for 10 minutes at about 190 deg. F. The resulting solution has excellent keeping qualities.

The prepared solution is added to normal skim milk in amounts from 0.05 to 10 percent, and the modified milk is dried in any desired manner.

Digest from U. S. Patent 2,319,186, issued May 11, 1943, to J. D. Ingle, and assigned to Industrial Patents Corp., Chicago.

VITAMINS

Ascorbic Acid Complex

PROTEIN-COMBINED ascorbic acid has been demonstrated to be present in carrots after the usual extraction of free ascorbic acid with metaphosphoric acid. The ascorbic acid can be liberated from the protein complex by hydrochloric acid hydrolysis and by enzymic digestion. Since ascorbic acid in the protein complex is biologically available, it must be taken into account in determining the value of different foods and in comparing chemical and bioassay methods. Protection of ascorbic acid by such a combination during dehydration or other processing should be investigated.

Digest from "Protein-Ascorbic Acid Complex in Carrots," by E. DeEds, *Food Research*, vol. 8, 275-79, July-August, 1943.

Preserving Vitamin C Of Green Walnuts

GREEN walnuts have been reported to contain 700 to 3,000 mg. per 100 grams of vitamin C. Preservation in brine leaches out most of the vitamin during the first days of immersion. Use of the green walnuts in chopped sweet mixed pickle gave much better initial vitamin values, but the vitamin C was not stable on storage in this medium, so that pickles and chutney are not satisfactory products in which to incorporate the green walnuts.

Up to 10 percent of the minced walnuts can be added to dark colored jams with much better retention of the vitamin.

Digest of "Green Walnuts as a Source of Vitamin C," by L. H. C. Barton, *Food Manufacture*, vol. 18, 254–56, August, 1943.

Turkeys Used in Vitamin D Assay

TURKEY poults have been found more suitable than chickens for vitamin D assays. Measurements of vitamin D are based on calcification of the bones. Poults raised for three weeks without vitamin D will have only about 25 percent mineral in their bones, while poults receiving ample vitamin D will have over 45 percent. The comparable range for chicks is only between about 30 and

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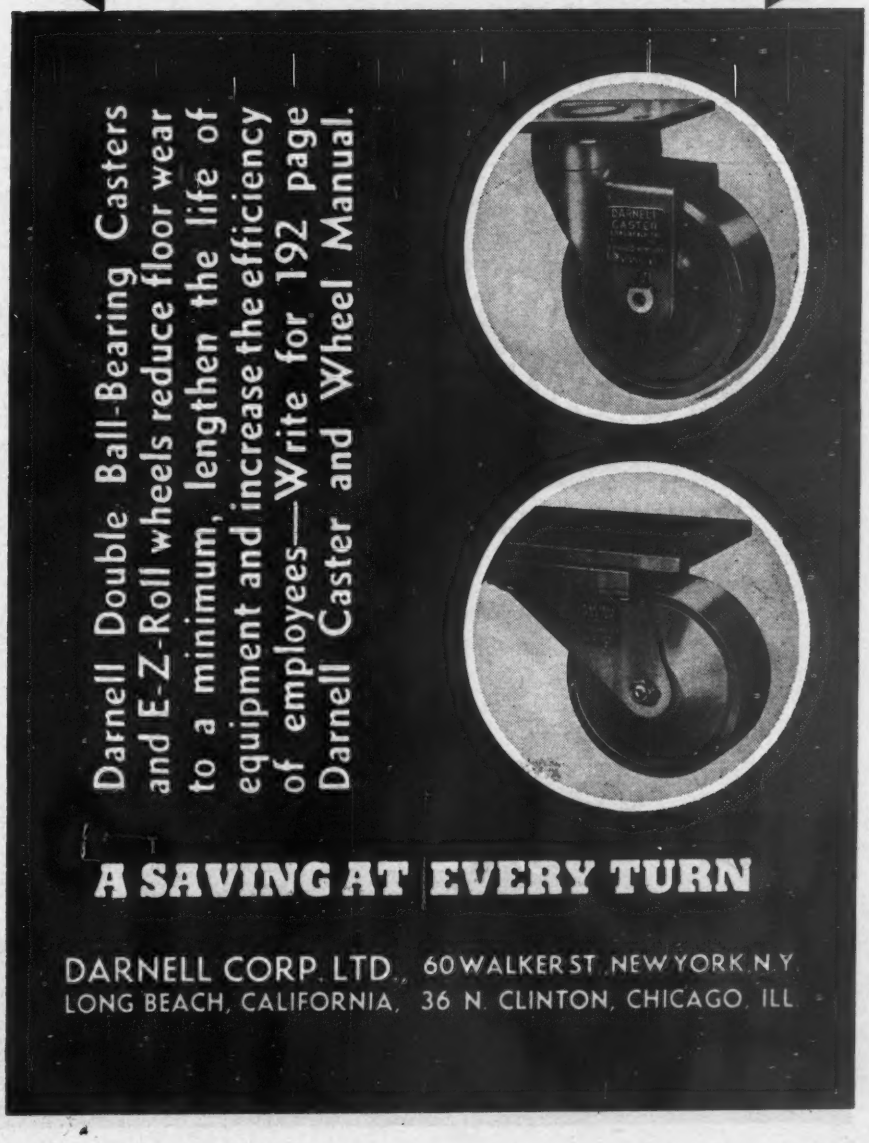
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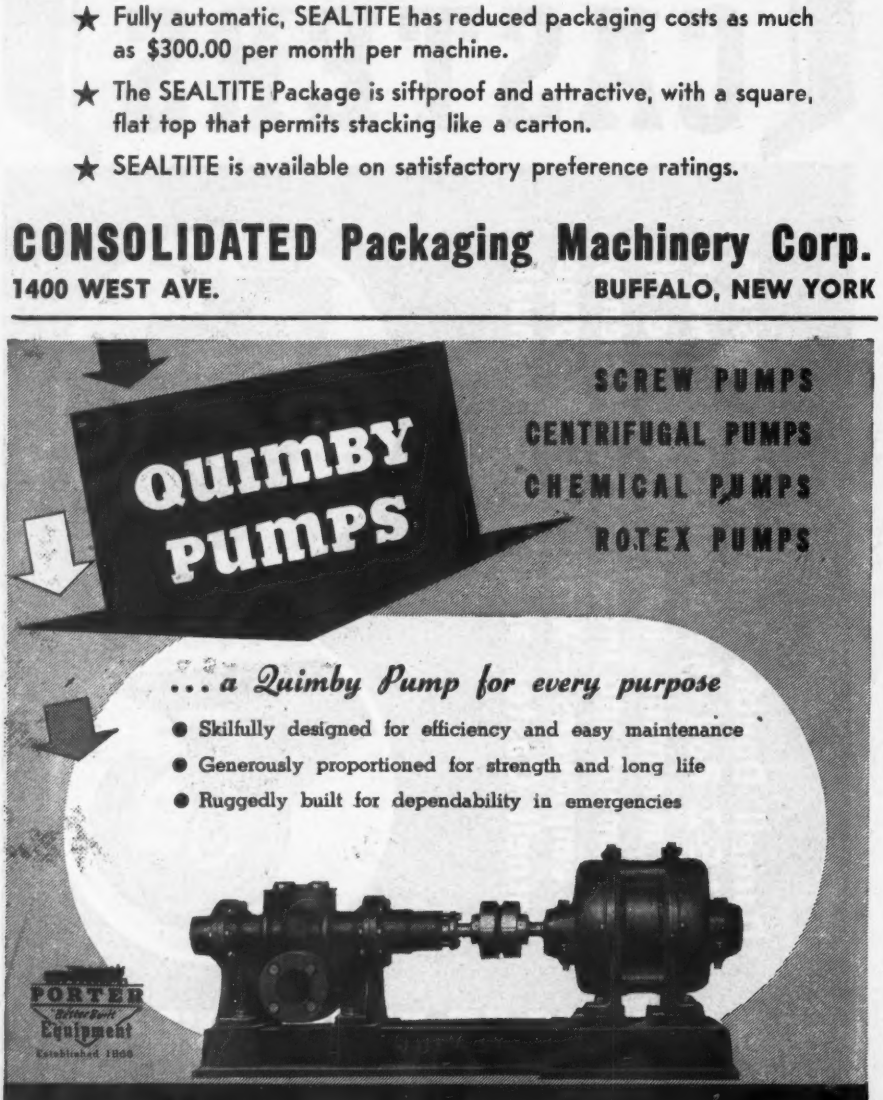
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40 percent. In the absence of vitamin D, turkey poults invariably develop severe rickets in three weeks.

Digest from paper by G. B. Willgeroth, J. L. Halpin, H. R. Halloran and J. C. Fritz, presented before Division of Agricultural and Food Chemistry, American Chemical Society, at Pittsburgh, Sept. 10, 1943.

QUALITY CONTROL

Soluble Protein Content Of Dried Whole Egg

A RAPID and convenient refractometric method for determining the soluble protein content of dried whole eggs has been developed. The egg powder is defatted with petroleum ether and separated from the solvent by centrifuging. Protein is extracted with 5 percent sodium chloride. The refractometric value of the extract is determined at 25 deg. C. using an Abbé refractometer.

The method is sufficiently precise for research investigations and rapid enough for quality control.

Digest from "Dried Whole Egg Powder. III. A Refractometric Method for the Determination of Solubility," by W. H. White and G. A. Grant, *Canadian Journal of Research*, vol. D,21, 203–210, July, 1943.

MISCELLANEOUS

Solder for Food Cans

RESULTS of extensive tests conducted by National Canners Association and cooperating commercial laboratories, under direction of the War Metallurgy Committee, have furnished conclusive evidence that the use of substitute lead-silver solders will not cause absorption of lead above the permissible 2 million p.p.m., either for sanitary cans or the floated-end cans used for evaporated milk.

Nine months storage at 98 deg. F., equivalent to 2 years at ordinary temperature, gave average figures for 97½-2½ silver-lead, and 95-2½-2½ and 93-2-5 lead-silver-tin solders of 0.09 p.p.m. for corned beef hamburger, 0.03 for finely chopped green beans, 0.08 for orange juice and 0.34 for evaporated milk. It has also been shown that there is no danger from accidentally included solder spatter.

Digest from Information Release No. 6, War Metallurgy Committee, August, 1943.

Prevention of Browning

THIOUREA, NH_2CSNH_2 (thiocarbamide), will prevent browning in peaches, pears and apples during and after freezing. For peaches and pears, a 0.1 percent solution is sufficient, for apples 0.15 or 0.20 percent is required. The presence

of sugar does not interfere in the case of peaches and pears, but it does for apples.

When fruit is dipped in this solution and then frozen, the system which causes browning is inactivated, so that browning will not occur when the fruit is thawed and exposed to the air, even after being leached with water to remove the thiocarbamide.

Storage of dipped apples at zero deg. C. for several days is sufficient to permit inactivation. When the fruits are frozen at − 6 to − 10 deg. C, one or two days is enough for inactivation of browning in peaches, 2 to 4 days for pears and 10 days for apples. But fruit was stored as long as 15 months in good condition, without browning during frozen storage or when thawed in the air.

Digest from "Inactivation of the Browning System in Frozen-Stored Fruit Tissue," by F. E. Denny, *Contributions of Boyce Thompson Institute*, vol. 12, 309-20, January-March, 1942.

Industrial Casein

CASEIN which forms clear and relatively transparent gels with edible acids such as citric and acetic, and which can be dispersed readily with edible acids or alkalies, is claimed to be produced by a recently patented process. The product is also in a form particularly well adapted to the manufacture of synthetic fibers and plastics.

After milk protein is completely coagulated with an enzyme such as rennet, the acidity is adjusted immediately to a pH of 4.6 to 4.7, which is near the isoelectric point. Curd precipitated in this way has a uniform particle size, without tendency to stick together, so that the casein can be washed with water to a pH of 4.6 to 5.5. Yields of 2.9 percent from skimmed milk are claimed. Drying must be done carefully, starting with a temperature not over 125 deg. F. and not at any time exceeding 175 deg. F.

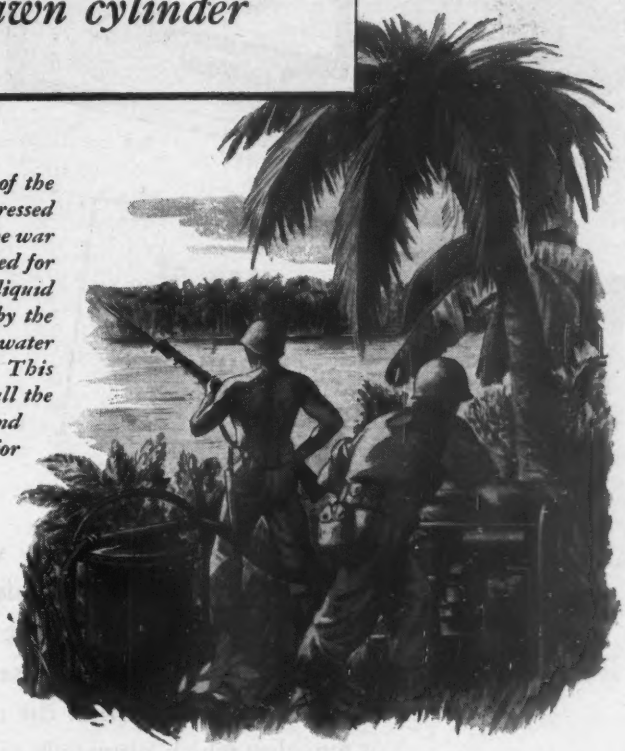
Digest from U. S. Patent 2,320,165, issued May 25, 1943, to F. C. Atwood and W. Paterek, and assigned to Atlantic Research Associates, Inc., Newtonville, Mass.

Drying Fluid and Semi-Fluid Foods

MILK, eggs and other fluid or semi-fluid food products can be dried, according to a recent patent, by causing a stream of hot oxygen-free gas, such as carbon dioxide, to be mixed with the food material, then the combined streams are discharged under pressure into a closed space so that the foodstuff is atomized and the residual heat in the gas drives off the moisture. The process is claimed to avoid vitamin destruction.

Digest of U. S. Patent 2,324,914, issued July 20, 1943, to H. R. Dickinson and H. H. Moreton, respectively, of Grand Rapids, Mich., and East Orange, N. J.

Jungle waters are purified ... with the aid of a deep-drawn cylinder



Shown below is another of the many products built by Pressed Steel Tank Company for the war effort. This cylinder is used for transporting and storing liquid chlorine, vitally needed by the armed forces for purifying water supplies in the tropics. This Hackney Cylinder meets all the strength, weight, safety and handling requirements for this type of container.

Hackney Chlorine Cylinders are used in the transportation and storage of chlorine, bringing it safely to destination over thousands of miles of land and sea. They comply with I.C.C. specifications. These cylinders are made from flat circular plates of steel. By a series of cupping and cold-drawing operations they are formed into seamless cylinders made to exacting specifications with uniform sidewall thickness. The result is a lightweight cylinder, yet one providing adequate strength.

Hackney Drums and Barrels

Products like the one described above keep rolling out of Pressed Steel Tank Company's factory. Today, all of Hackney's facilities are pledged to the making of products for Victory. Hackney drums and barrels are now in service for hundreds of war plants —helping to solve transportation and storage problems for vital foods. Thus, they are hastening the day when their advantages can be available to all businesses.

When that day arrives, the vast knowledge and research of Hackney's wartime experiences will be available to all industry. It is your assurance that Pressed Steel Tank Company will continue to make improved containers for gases, liquids and solids.

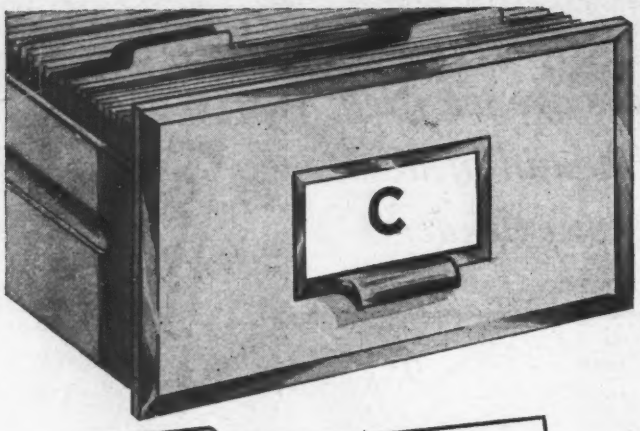
Pressed Steel Tank Company

MANUFACTURERS OF HACKNEY PRODUCTS

General Offices and Factory · 1457 SOUTH 66th STREET

Milwaukee, Wisconsin

CONTAINERS FOR GASES, LIQUIDS AND SOLIDS



CRY·O·VAC

First of a series of
CASE HISTORIES
of commercial uses
of CRY*O*VAC

The Story of CRY·O·VAC*

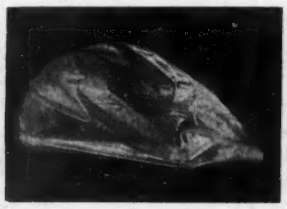
Few realize the extent to which the future of quick freezing depends upon the effectiveness of the protective wrap. In addition to keeping the food sanitary and attractive, it must prevent the drying out or rancidity which ultimately results from contact with even a limited amount of air.

CRY·O·VAC is a packaging method designed *solely* for frozen or refrigerated foods. The patented CRY·O·VAC bag is tasteless, odorless, transparent, and impervious to moisture. It is the only wrap so tough and flexible at low temperatures that it can be successfully vacuumized to remove air which may cause drying out and rancidity. Moreover — and this is an important feature of the CRY·O·VAC process — it has the unique property of shrinking sharply with moderate heat (applied either before or after the freezing operation), thus instantaneously removing unsightly wrinkles.

CRY·O·VAC — before the war forced its temporary withdrawal — was used on a great variety of products from beef to berries, by packers ranging from General Foods to individuals with deep-freeze units. Its story has never been advertised because production could not keep pace with the demand. Now, however, we plan to tell each month a story of the use of CRY·O·VAC before the war. We shall not attempt to prophesy for the post-war period. That story will be written by producers and consumers as they find that only CRY·O·VAC can give the protection that frozen foods require.

1 Eviscerated Chicken trussed for packaging.

2 Unexpanded CRY·O·VAC bag.



3 Expanded CRY·O·VAC bag with chicken inserted

4 CRY·O·VAC protected chicken after vacuumizing, sealing and heat-shrinking.

a product of

DEWEY AND ALMY CHEMICAL COMPANY

CAMBRIDGE 40, MASSACHUSETTS

*CRY·O·VAC
REG. U.S. PAT. OFF
A product and a process for the protection of quick-frozen foods.

FORMULAS FOR FOODS

FORMULA NO. 428

Whipped Butter Spreads

Since butter is being rationed by the point system, it is probable that the annual consumption may be lower than estimated, but some unforeseen events, such as a dry summer or diversion for other dairy products of milk normally used in the manufacture of butter, may further reduce the supplies available for civilian use. To extend the butter supply as far as possible, some dairy companies and individual users have resorted to the manufacture of butter spreads, a procedure likely to become more popular as the supply of butter for civilian use becomes less.

Butter spreads can be used in place of butter except for some purposes such as greasing pans, frying or sauteing. For these uses, butter or other fats or oils are required as they adhere to the pan when heat is applied. This does not apply to whipped butter, since nothing has been added to this product except air.

Formulas for whipped butter and a butter spread follow.

	Whipped butter	Whipped butter spread
Salted butter	100 lb.	50 lb.
Cream, 19 percent*	.....	50 lb.
Butter color	50 ml.	90 ml.
Starter distillate	.....	25 ml.
Salt	8 oz.	6 oz.

*Or the equivalent in cream and skim milk

Directions

For the whipped butter, soften to about 65 to 75 deg. F., so that it is soft enough to work easily. Add the salt and butter color. Whip until the desired overrun (50 to 100 percent) is obtained, then run directly into packages and place in the refrigerator at 40 deg. F. to harden.

The butter spread is made by whipping the butter in the same way. Add the starter distillate and salt to the cream, then slowly add this to the whipped butter and continue whipping until the desired overrun is obtained. The greater the overrun in the whipped butter, the greater will be the overrun in the finished product. The finished spread should test about 50 percent butter fat and 4 percent milk-solids-not-fat.

Remarks

For producing small quantities of either of these spreads an electric mixer of the beater type is most efficient. For larger production, any kind of a beater that is able to whip the butter to the desired overrun can be used. Counter and batch ice cream freezers, with the refrigeration turned off, are suitable for the purpose. It is possible to secure over 100 percent overrun by using an ice cream batch freezer.

This product can be molded, cut into squares, or sold in bulk. The whipped butter spread has a tendency to be brittle, especially when just removed from the refrigerator, but on standing a short time at room temperature it can be spread more easily than butter.

Methods for making this type of spread in the home are contained in "Wartime Dairy Spreads for Home Use," by Harry Pyenson and P. H. Tracy, Circular, University of Illinois, March 1943.

Formula from Pyenson and Tracy.

FORMULA NO. 429

Graham-Soya Bread

Spring clear flour	80 lb.
Soya flour	10 lb.
Bran	10 lb.
Water (variable)	70 lb.
Yeast	2¾ lb.
Yeast food	2 oz.
Cane sugar	2 lb.
Dark molasses	3 lb.
Salt	2 lb.
Shortening	1½ lb.

Directions

Have dough at 77 deg. F. Mixing time on high speed is 5 to 6 minutes. Fermentation times are: for the first fold, 1½ hours; second fold, ¾ hour; and to the bench, ¾ hour. Follow standard practice in handling and baking.

Formula from Stein, Hall Mfg. Co.

FORMULA NO. 430

Jelly Cream

Fine sugar	3 lb.
Gelatine powder	10 lb.
Whole milk powder	6¾ lb.
Dry fruit flavor	as desired
Certified color	as desired

Directions

The ingredients must be perfectly dry and well mixed together. A mixing machine should be used to insure thorough mixing.

Package so as to keep free from moisture.

Approximately 3 oz. will make a pint of dessert, but the exact quantity to recommend should be determined by experiment.

Formula from H. B. Cronshaw, Surrey, England.

FORMULA NO. 431

Texas Frankfurters

Cow beef	100 lb.
Pork trimmings	50 lb.
Chili spice mixture	2 lb.
Soya flour	6 to 9 lb.
Tomato puree*	20 lb.

* This is not to be used in hot weather.

Directions

Use either the quick cure or the standard cure, both of which are repeated below for convenience. Chop the cure in well with the meat, using plenty of ice. Be sure the mix is stiff. Place in box-truck in cooler at 45 deg. F. to cure.

When cured, chop with the soya flour, tomato puree and spices. Stuff casings tight. Allow to hang one-half hour or more in workroom before placing in the smokehouse. Rinse with hot water. Smoke 1½ hours at 165 deg. F. Then cook in 12 to 15 minutes at 165 deg. F. Rinse with hot water to remove the grease. Sprinkle with salt water until cooled.

The standard (7-day) cure requires for each 100 lb. of meat:

Salt	3 lb.
Sugar	12 oz.
Nitrate (or saltpeter)	3 oz.

By using ½ oz. of nitrite instead of the nitrate, this can be made a 3-day cure. The quick (24-hour) cure is:

Salt	3 lb.
Sugar	12 oz.
Nitrite	½ oz.

Remarks

This kind of frankfurter will be pleasantly juicy, as well as tasty. It is a good seller in lunch rooms and grills where beer is served.

When a red frankfurter is desired, use the standard cure. The temperature in the curing room should be 45 deg. F. The importance of the proper temperature in curing meats justifies particular emphasis on this point. Pale sausages may be caused by a too low temperature in curing.

In warm weather soya flour should never be added to a quick-cure sausage mix that is to be stuffed and hung overnight. The meat must be cured in a box-truck, as described.

When any binder, especially soya flour, is used in large quantities, the mix should be made very stiff for frankfurters and bologna. With the heavy load of water required with soya flour, the products will not take smoke and will not give the desired results unless the mix is stiff.

Formula from Stein, Hall Mfg. Co.

A new discovery from the laboratories of Distillation Products . . .

MYVA-DRY

VITAMIN A POWDER

★ *Amazingly Stable—Distilled Concentrate of Vitamin A in*

DRY POWDER FORM

MAKES POSSIBLE THE A-FORTIFICATION OF MANY ADDITIONAL FOOD PRODUCTS

Almost since the first introduction of our Distilled Concentrate of Vitamin A Esters in oil, certain food processors have been asking us for a similar stable concentrate in dry powder form.

Today we are proud to announce the introduction of *Myva-Dry Vitamin A Powder.*

This new discovery is a dry powder containing distilled concentrate of vitamin A together with the vitamin's natural protective agents. In this form, the way is cleared at last for A-fortification of a host of food products.

Fine Powder, Easily Blended Form

Myva-Dry Vitamin A Powder is produced in a uniformly fine, pulverized form. It is not granular. It is easily mixed with powdered foods and beverage powders, and is uniformly dispersible. The protective carrier of the dry vitamin A concentrate is an edible, nutritious vegetable powder, and vitamin A concentrate is evenly dispersed through this carrier for smooth, convenient incorporation.

Highest Vitamin A Stability

Our research laboratory reports that Myva-Dry Vitamin A has the highest stability of any vitamin A preparation, liquid or solid, that it has yet measured. The difficulty of preparing a stable powder has been solved with an unexpectedly high margin—a margin of inestimable benefit to the user.

Myva-Dry Vitamin A Is Tasteless In Foods

In its concentrated form, Myva-Dry has a characteristic flavor and odor, typical of foods but not of marine oils. When incorporated in a large proportion of edible product the flavor is completely lost, a characteristic which will be appreciated by the processors of delicate foods.

Our Service Staff Will Test Your Product

If you have a product that may profitably share this new vitamin discovery, DPI's well-known Service Laboratory will work with your technical men to develop a proper incorporation formula. You simply check the results, weigh the sales potentialities.

Get Advance Information, Now

Send today for advance information on *Myva-Dry Vitamin A Powder.*

Be first in your field to realize this new vitamin value.

★

DP INC.

DISTILLATION PRODUCTS, INC.

755 RIDGE ROAD WEST, ROCHESTER, NEW YORK

Jointly owned by EASTMAN KODAK CO. and GENERAL MILLS, INC.

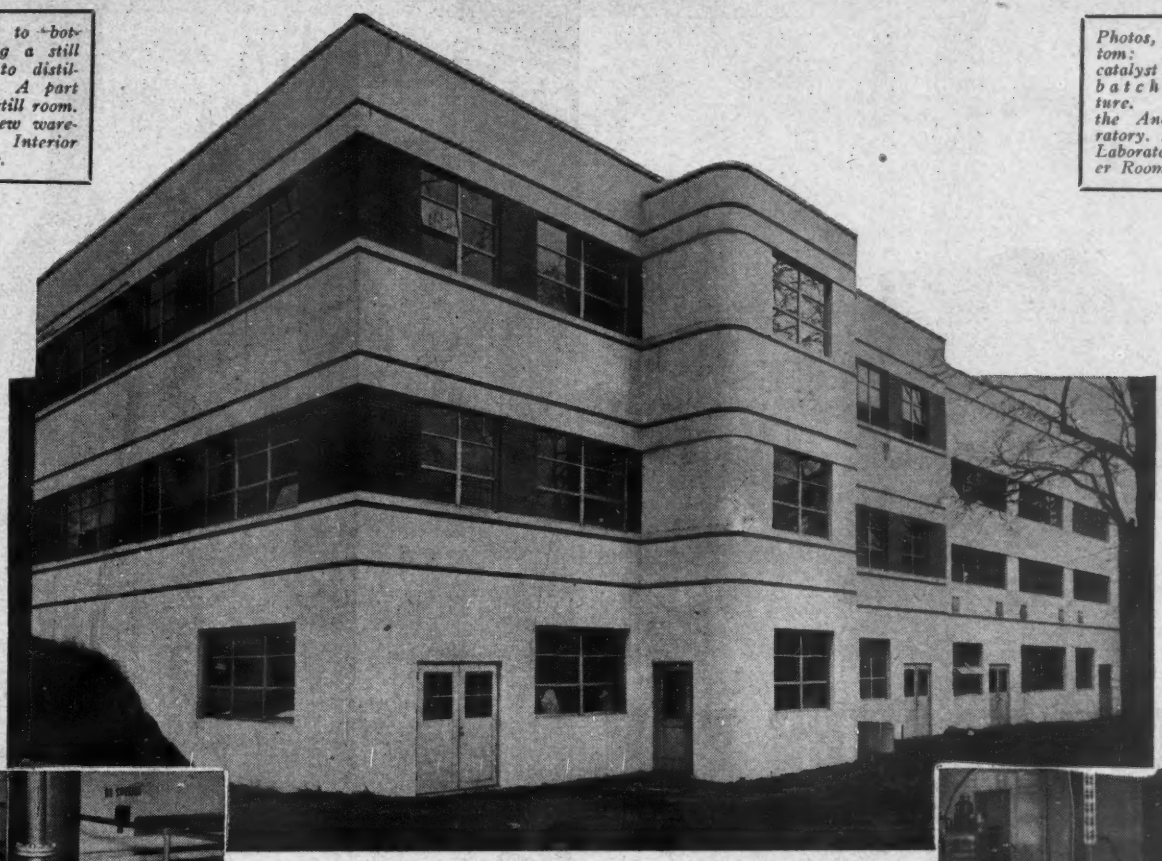
Sales Agent:

Special Commodities Division, General Mills, Inc., Minneapolis, Minn.

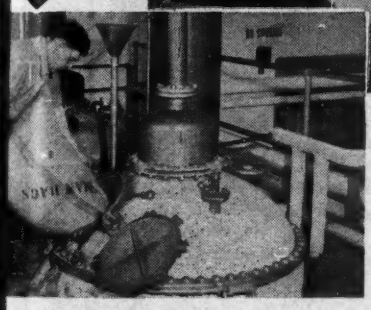
"Oil-Soluble-Vitamin Headquarters"

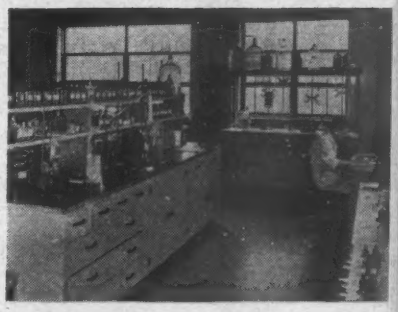
BACKGROUND VALUES . . . a PART of the product, APART from the price

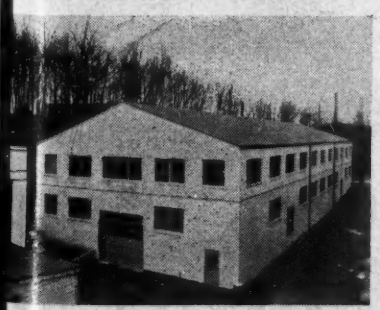
Photos, top to bottom: Loading a still preparatory to distillation. . . . A part of the main still room. . . . The new warehouse. . . . Interior of warehouse.

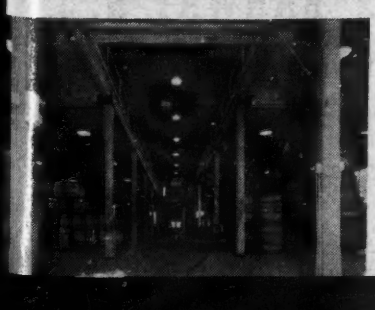


Photos, top to bottom: Preparing a catalyst for large batch manufacture. . . . Part of the Analytical Laboratory. . . . Research Laboratory. . . . Boiler Room.









A NUMBER of important oils and flavoring materials once produced for us abroad are now being manufactured in our American plant at Clifton, N. J., under the skilled supervision of our staff specialists. The new building above, with its increased laboratory, distillation and warehousing facilities as pictured, represents a timely and invaluable enlargement of existing facilities. Now, many of the costly, hard-to-get materials, formerly bought through middle-men, are being manufactured by us and sold to our customers with resultant benefits of economy, convenience and assured high quality accruing in their favor. Typically, these advantages are all a PART of Fritzsche products, APART from their price. Why not let our representative prove in dollars and cents, how they can benefit *you?*

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FLAVOR RAW MATERIALS

Est. 1871

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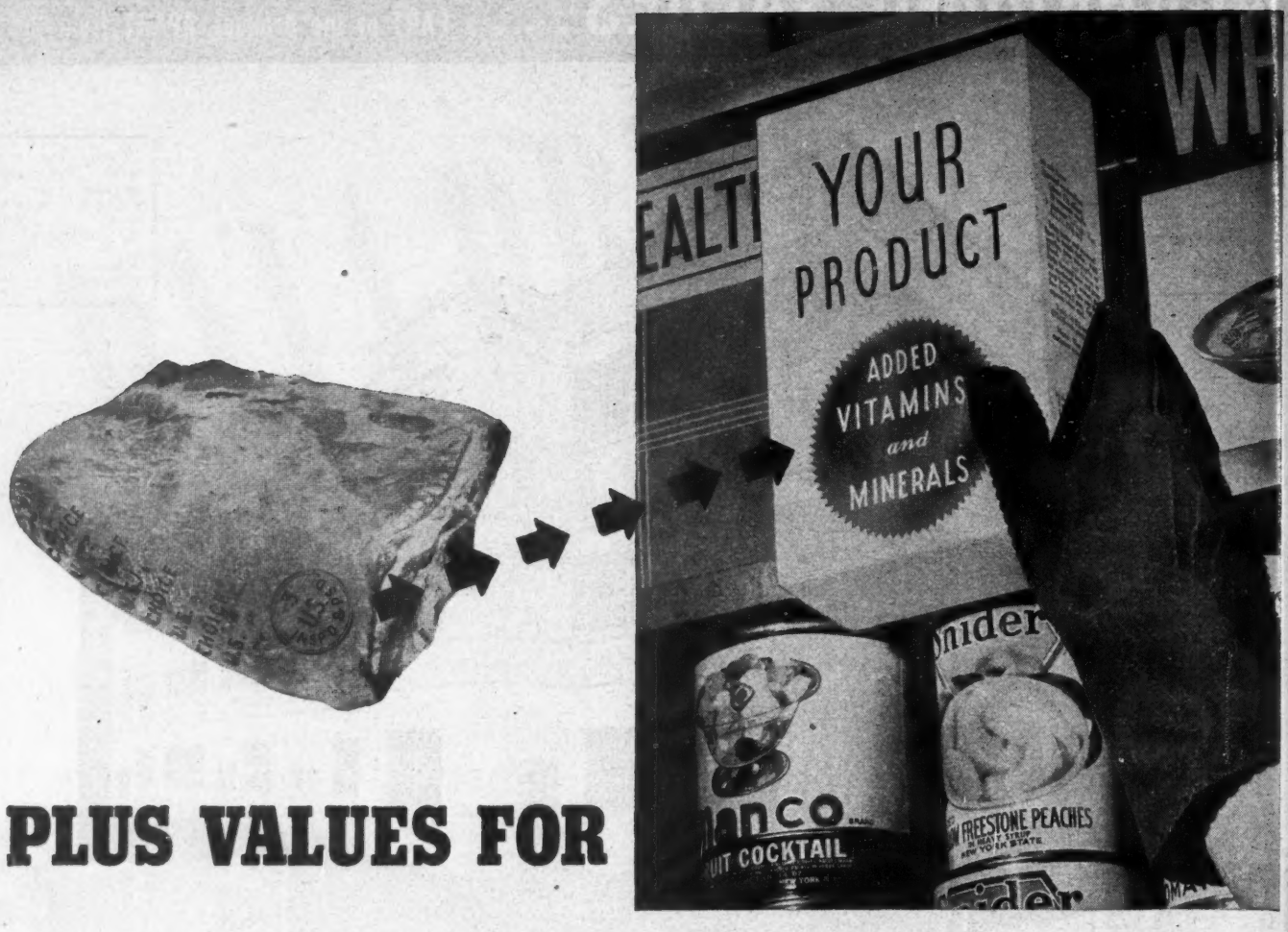


PLUS VALUES FOR *Selective Shopping*

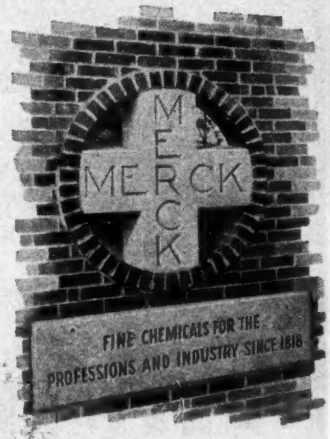
Only clean, wholesome meat can carry the Government stamp "U. S. Inspected and Passed." To the housewife, this is a standard of quality—indicating that she is getting the highest possible value for her money, and ration points.

In these days, when every penny must be spent carefully to ensure healthful living, shoppers are buying by recognized standards. They know the importance of providing diets rich in essential vitamins and minerals, and they are reading label statements—selecting those products which give them the best nutritional value for their money.

Preference everywhere is going to those food products that give housewives "added vitamins and minerals." This simple statement on your label is a powerful point-of-sale appeal that makes *your* product a *preferred* product.

Obtaining this preference usually is not difficult nor expensive. The Merck technical staff and laboratories offer assistance in ensuring adequate distribution and retention of the vitamins and minerals, and in product control methods.

We will gladly put our facilities to work to help you gain the preference of selective shoppers for *your* product.



MERCK & CO., Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

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In Canada: MERCK & CO. Limited, Montreal and Toronto

Announcing!

37½% to 50%

Reduction in price of VITAMIN D
Steenbock Process

Since August 15, 1943, the following price changes are effective until further notice.

STANDARD BRANDS VIOSTEROL
Steenbock Process

(400,000 U.S.P. Units of Vitamin D per gram in neutral vegetable oil)

OR

FLEISCHMANN'S HY-DEE IRRADIATED YEAST
(24,000 U.S.P. Units of Vitamin D per gram)

ANNUAL CONTRACT

Per Million U.S.P. Units of VITAMIN D

	If used in Pharmaceutical Products	If used in Food Products (Except in certain restricted fields)
25 Billion Units and over	.10	.08
10 Billion to 25 Billion Units	.11	.09
1 Billion to 10 Billion Units	.12	.10
Single Shipment: Less than 1 Billion Units	.14	.12

These prices are net—FOB Peekskill, New York

Standard Brands Incorporated

Pharmaceutical Division *595 Madison Ave., New York 22, N.Y.*

MATERIALS
FOR THE FOOD MANUFACTURER

VioBin ANTIOXIDANT

An effective antioxidant in concentrations of 0.05 and 0.1%; for animal and vegetable fats.

DEFATTED, DEHYDRATED
PERFECTLY STABLE

WHEAT GERM
CORN GERM

Richer in B complex than original raw germ. Among richest foods known in B complex, high quality protein, iron and phosphorus.

VioBin WHEAT GERM Oil

Perfectly stable—requires no refrigeration.

VIOBIN CORPORATION
36 Oak St. Monticello, Ill.
VioBin (Canada) Ltd., 637 Craig St., West, Montreal, Quebec

Why does
CARROT OIL
make foods golden yellow?

Because carrot oil contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.

Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil, and because it contributes vitamin A of high stability and desirable golden yellow color.

Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

Also producers of ThiaBee, a stabilized wheat germ products rich in Vitamin B_1.

These vitamin products are of particular interest to all manufacturers of food products.

Inquiries are invited. Literature, prices and samples to firms requesting same on their letter heads.

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Pearl Tapioca — Potato Starch
Egg Albumen — Rice Flour
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Stabilizers — Soya Bean Flour
Corn Starch — Vegetable Gums
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THE POWERS REGULATOR CO.

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QUAKER CITY COLD STORAGE CO.
PHILADELPHIA, PA.
3 WAREHOUSES 3
Proper Temperature For Frozen Foods

"WHAT CAN IT DO FOR ME?"

Advertising that is read with this thought in mind, may provide the solution to a burdensome problem. Remember, back of the signature of every advertiser in this issue is another organization, whose members have thought long and hard about your business in the course of introducing and applying their products or services to your industry.

If their offerings can improve the quality of your company's product . . . or save your company's money . . . they can contribute to your company's income.

We all know, "It pays to advertise." It pays just as big to investigate *what is advertised!*

All in the Same Boat!

WHEN the butcher says, "No meat today!" and the garage posts a "No Gas" sign, none of us likes it . . . but why cuss out old friends?

After all, it isn't their fault. Blame it on the Axis, the Black Market, or whom you will . . . but not on Joe the butcher, nor Fred the garageman. They gave you top-notch service when they could, and some day (soon, we hope) they will do your bidding again . . . with a smile!

Meanwhile, nothing would please them more than to fill your platter and gas tank — with no questions asked or coupons required.

Try to think of it that way the next time a supplier swallows hard and says, "Sorry, . . ." Remember, we are all in the same boat and can get back to solid ground more quickly by pulling together.

NATIONAL ADHESIVES

DIVISION OF

NATIONAL STARCH PRODUCTS INC.

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They Taste FIRST with Their Eyes

The fewer the ration points, the harder they shop! Color that promises better flavor, pries loose the "points" today.

National Certified Food Colors meet every requirement of uniformity in shade, strength and solubility to give your food exactly the color you want.

For thirty seven years National has made the food industry's largest and oldest line of Primary Colors and Blends... has helped producers of glass-packed foods put the sales-appeal of color into fruits, condiments, beverages and other items.

We invite you to use National Technical Service on food-color problems.

Certified Food Color Division

NATIONAL DYES

NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION

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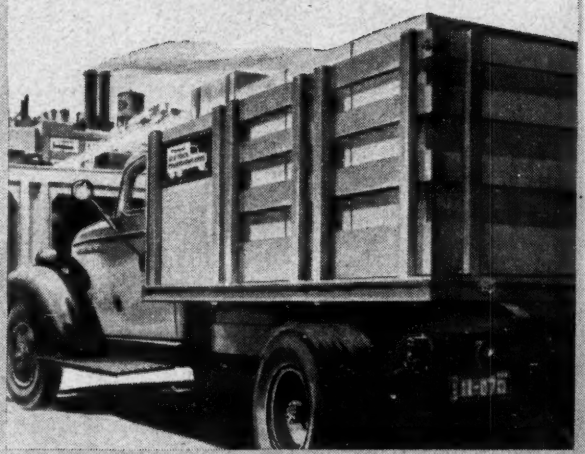
BOSTON PHILADELPHIA GREENSBORO CHATTANOOGA
PROVIDENCE SAN FRANCISCO ATLANTA PORTLAND, ORE
CHICAGO CHARLOTTE NEW ORLEANS TORONTO

TRUCKS MUST ROLL



FROM A STATEMENT BY JOSEPH B. EASTMAN, DIRECTOR, OFFICE OF DEFENSE TRANSPORTATION

"... the preservation, conservation and maintenance in effective condition of motor transportation is just as vital to the nation as is the preservation, conservation and maintenance in effective condition of ... any other form of transportation."

★ ★ ★

General Motors Truck dealers were pioneers in truck conservation. Their Preventive Maintenance procedure, originated way back in 1928, has served as a pattern for both ODT and Army maintenance programs. Their entire service facilities ... men, equipment and methods ... have been geared to wartime needs of truck owners. Your trucks will roll longer and more efficiently if you give them regular GMC Service.

Special "Service Payment Plan" available through our own YMAC

BACK THE ATTACK — WITH WAR BONDS

Buy at least One Extra Bond during the 3rd War Loan Drive

Pledged U.S. TRUCK CONSERVATION CORPS

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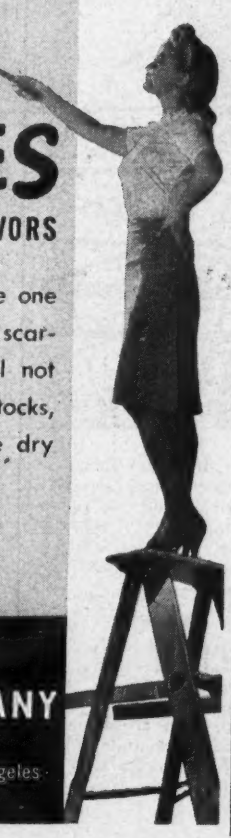

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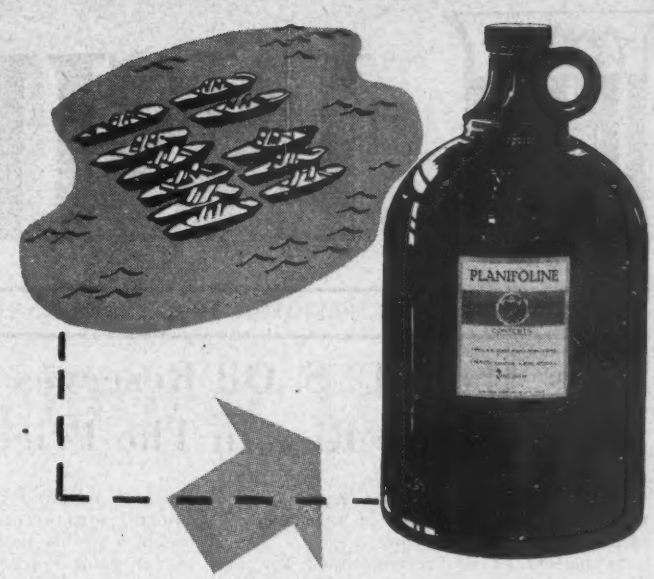

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A carefully balanced—synthesized reproduction of the physical and natural entities found in the extractive matter of the finest vanilla beans. In taste and aroma, possessing all the characteristics of Pure Vanilla.

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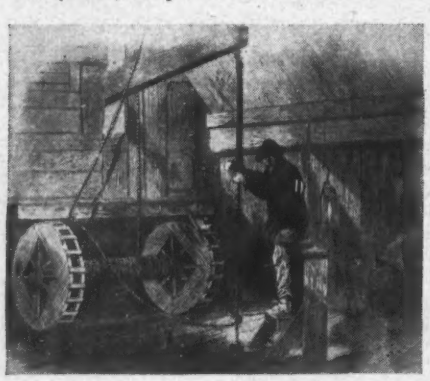
INSIDE NEWS

OCTOBER PREPARED BY NATIONAL CAN CORPORATION, NEW YORK, N. Y. 1943

Facts About U. S. Oil Reserves Indicate Inevitable Rise In The Price of Crude

Whatever happens in Congress this month, a *rise in the price of crude seems inevitable in the long run.*

Supporters of the recommended 25c to 35c per barrel price rise—including Petroleum Administrator Harold Ickes—point to expense of wartime wildcatting, approximately $47,000 per well, current costs of



Boring for oil in the Pennsylvania "Oil Creek" region in 1864 required little more than a rope, a drill and a gambling spirit.

400,000-well operations in the teeth of manpower and material shortages, and extra investment required to make stripper wells profitable.

War or no war, however, costs are bound to rise as the supply dwindles. Estimated known reserves of 20 billion barrels are said to be good for 16 years, but the key fact is this: *rate of flow slows down in older wells, becomes increasingly difficult to maintain.*

Advancing discovery and extractive techniques together with hydrogenation processes will change the picture, but are not expected to modify higher costs—at least, not from the point of view of safe, long-range planning.

Hopeful names in oil news today include the Calgary wildcats now under way . . . Athabascar tar sands, also Canadian, with an enormous potential for gasolene, kerosene and fuel oil, but no lubricants . . . and California, where 64% more wildcat wells were drilled in first 5 months of '43 than in the same period of last year.

Oil men point to coal and oil shale as a long but last-ditch defense against dependence on imports. *Oil industry as a whole looks to petroleum chemistry as most promising source of new business, post-war.*

Post-War Oil Notes. High octane gas, plastics, pharmaceuticals, glycerine . . . many new elastomers . . . are old stories now, but note a new war-secret synthetic, effective for its purpose when diluted to one part in 100,000,000 . . . a new "anti-oxidant" so powerful that a handful of crystals in a freshly painted room prevents drying of paint indefinitely . . . a watch oil retailing at $700 a gallon in a container holding less than 1/6th of an ounce. Background reading: BUSINESS WEEK, "Revolution in Oil," special report . . . "Fightin' Oil" by Harold Ickes, a friendly but shrewd analysis by the Petroleum Administrator for War . . . and statistics from American Petroleum Institute, 50 West 50th Street, New York City.

Modern "wildcat" drilling, using fast, powerful machinery, now costs $47,000 per speculative well, is required by the war program. (442)

Painting with Light

Walls of post-war homes may be decorated with paint designs that are invisible under ordinary lights, but glow under ultra-violet illumination. Different color schemes will be produced by flicks of a fluorescent light switch. (443)

Dustless Homes

Dustless homes are promised by new industrial dust catchers that impart a positive charge to particles of dust traveling in air over five tungsten wires, charged with 12,000 volts. Parallel steel plates charged with negative electricity snatch and hold these particles. Present uses are in the manufacture of blood plasma, powdered milk, where a building of pure air is essential. (444)

Dehydration Needs

In May of last year, some 20 plants were dehydrating vegetables at the rate of 15,000,000 pounds a year and by now 188 plants are scheduled to be operating at the rate of 200,000,000 pounds a year. But since double that amount is the goal, 200 additional plants are needed. Pre-war production of dried eggs was 3,000,000 pounds and the 1943 needs will be 480,000,000 pounds. (445)

N. E. Castor Beans

New England states are now growing castor beans and may soon compete successfully on a postwar basis with tropical regions from which our castor oil has previously come. Experiments with colchine are transforming low-yielding New England castor plants to a plant yielding more and larger pods. A southwestern university, working with colchine, has developed a new strain of soybean almost twice the size of the original. (446)

Coal Potentialities

Coal, one of Nature's most common raw materials, is potentially richer in rubbers than all the islands of the East; more bountiful in fibers than all the Japanese silkworms; wealthier in colors than the rainbow; and abounding in curative medicinals. (447)

Coating Compositions

Styryl phenols, reacted with a gas, form resins that are compatible with drying oils, and useful in coating compositions, according to a recent United States patent. (448)

Cork Substitute

A newly developed cork substitute made from soap, cement, glue and water is announced out of Capetown, South Africa. Since cork is on the restricted list, shipping difficulties have made technicians look for substitutes. The result of this South African alternate for cork is said to float in water, has heat insulating qualities of cork, and has a definite construction strength. (449)

NATIONAL CAN

PLANTS: NEW YORK - BOSTON - BALTIMORE - CHICAGO - HAMILTON, OHIO - FORT WAYNE, INDIANA

New Purity Measurement

A new testing instrument has been devised to measure purity of distilled water. Results are expressed in parts per million of sodium chloride. (450)

Fermentation Speed-Up

The initial fermentation rate for maltose and galactose with yeast may be speeded if the fermentation takes place in the presence of an atmosphere containing more oxygen than air, and preferably in a pure oxygen atmosphere. Oxygen may be bubbled through the solution to provide additional contact. (451)

Leather Substitute

England is experimenting to combine a cellulose product with cotton waste, to serve as leather substitute in footwear production. (452)

Titanium a Common Element

As late as 1910, there was no important commercial use of titanium. The public was unaware of its existence, although countless Atlantic seaside bathers noticed the black specks in white sea sand. Chemistry books contained little information about it. Titanium was then a rare curiosity, but is now recognized as the ninth commonest element in the earth's crust. There is three times as much titanium in the world as carbon. Long after mankind has ceased to use coal as fuel, titanium oxide will still probably be used as a white paint pigment. (453)

Roach Control Through Crayons

Sodium fluoride crayons have been found convenient, safe, effective and economical in control of roaches. If the marks made with the crayons are not disturbed, they function for an indefinite period of time and offer protection against reinfestation. The added advantage of lessened danger of food or contamination over which roaches may run after contact with the poison is a further advantage. (454)

Bleached Handles

Handles of picks, shovels, pitchforks and other tools have that blonde appearance because they are bleached with hydrogen peroxide. (455)

Safety Glass for Coating

The plastic interlayer in automobile safety glass is now the coating for Army raincoats, hospital sheeting and drinking water bags. (456)

Technical Topics

DISINFECTANTS—Products of higher efficiency, less disagreeable odor, wider range of usefulness, less danger to the user etc. are forecast for the post-war period. New specifications of the Army (No. 3018C) and U. S. Bureau of Ships (51D6) indicate the present trend, which in many cases represent a distinct advance from pre-war disinfectants and germicides, customarily based on cresol or cresylic acid. (457)

QUININE ALTERNATE—Atabrine is being offered by a third producer in endeavor to bring production high enough to dispel some public and government worry about this important substitute. While quinine is a malaria prophylactic as well as remedy, atabrine has only remedial qualities, it is understood. (458)

SOAP AT WAR—The corrosive action of sea air makes it necessary to give extraordinary protection to metal war equipment now going overseas in huge quantities. A trace of water, even left by a fingerprint, is sufficient to etch a bearing or cylinder wall so that the machine may fail at a vital moment. As a solution, the metal parts are thoroughly cleaned with organic solvents, then with soap, quickly dried and wrapped in cellophane, pliofilm or similar substances. Intruding traces of water are rapidly absorbed by moisture-absorbing chemicals, placed inside the wrappings, which must be airtight. (459)

MEAT PRESERVATION—Treating meat within four hours after slaughter with hypertonic saline solution for 24 hours, followed by packing in hermetically-sealed container with 20% table oil and heat-treating at 75°C. for three successive days, is a recently-patented preservation process. (460)

RED SPIDER CONTROL—Lima beans for canning or freezing are so affected in some areas. Control measures must begin when plants are small, sulphur sprays and dusts being found best controls. Recommended formulas are available. (461)

PROTEIN AND VITAMIN RESEARCH—A new sodium sulphite process has uncovered almost pure protein with great potentialities. (462)

MARINE CONCENTRATES—Frozen clam broth with its ice separated produces a highly desirable concentrate containing 12% total solids which may be raised to 21%, from an initial 5%, by second processing. Believed applicable to other marine products. (463)

POULTRY PALATABILITY—Quick freezing of New York dressed poultry which was held six months before eviscerating provided superior palatability to birds eviscerated 18 hours after dressing, then multiple-plate frozen and held in storage for the same length of time. Economy for eviscerators. (464)

APPLES AND CITRUS TO WAR—United States pectin, accounting for half the world's supply, has a wartime shortage since its use as a blood plasma substitute in treating shock. Other war uses also vital. (465)

SOYBEAN LECITHIN—Suggested as lubricating oils inhibitor in place of synthetics containing critical materials. (466)

VITAMIN E—Effectiveness of Vitamin A has been doubled by addition of Vitamin E, a West coast pharmaceutical manufacturer claims. Its effects are noted on Vitamin A and D tablets, it is understood. (467)

SKIN VARNISH—Sterility in the operative field is the claim for a new skin varnish, formula for which is available. (468)

SULPHONATION SIMPLIFIED—Sulphonation of aliphatic compounds, such as oils, fats, and fatty acids, is claimed to be simplified by the process described in a recent patent. Easy control of reaction temperature is a further claim. (469)

HEXITOL ANHYDRIDE FATTY ACID ESTERS have been introduced for use as emulsifiers, detergents, and wetting agents by an American chemical company. Since they are non-electrolytes, are neither sulphates or sulphonated products, and are virtually free of soap and inorganic salts, they are stated to make possible a whole range of new applications. Solubilities range from completely water soluble to completely oil soluble. (470)

Every effort will be made to furnish additional information on these articles. Where such information is not obtainable, we will refer inquiries to the original source of the article. Write to National Can Corporation, 110 East 42nd Street, New York City. Please mention the number at end of article—also name of the magazine you saw it in.

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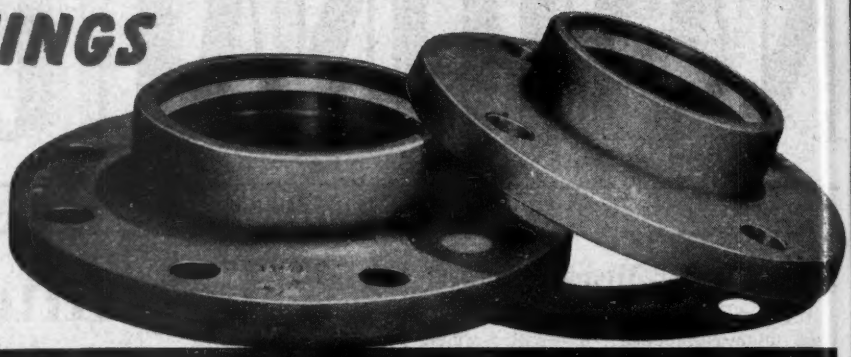
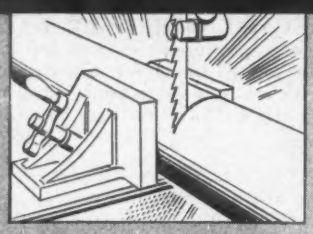
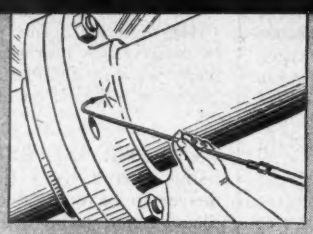


. . . THE MODERN METHOD OF JOINING COPPER OR BRASS PIPE AND TUBING

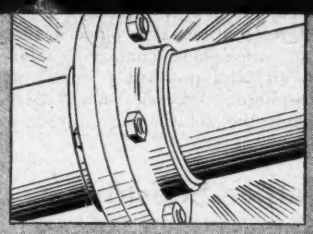


Cut pipe or tubing square, making certain that the pipe is not squeezed out of round or made undersize.

After cleaning flange and pipe carefully, apply flux to the flange recess and to the pipe or tubing.



Expand pipe by heating with the oxyacetylene flame. Next heat section of flange hub; then heat both pipe and flange hub section with wiping motion of torch.



Repeat process on adjacent flange hub and pipe sections. The joint is completed when a fillet of silver brazing alloy shows entirely around pipe at edge of hub.

You can save installation time and assure strong, permanent assemblies by using Walseal flanges, fittings and valves. As illustrated in the sketches above, four simple steps connect a flange to the pipe with a silver brazed joint that is tight, leak-proof, and has a corrosion resistance equal to that of the pipe or tubing itself.

Walseal flanges are completely machined, faced, and drilled before brazing so that the assembly is ready to go into the line immediately after brazing. No refacing is required after heating because the relatively low brazing temperatures do not cause any warpage of the flange faces.

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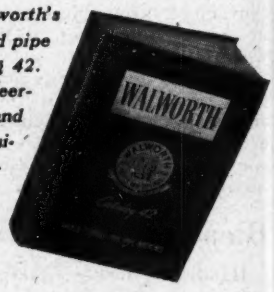

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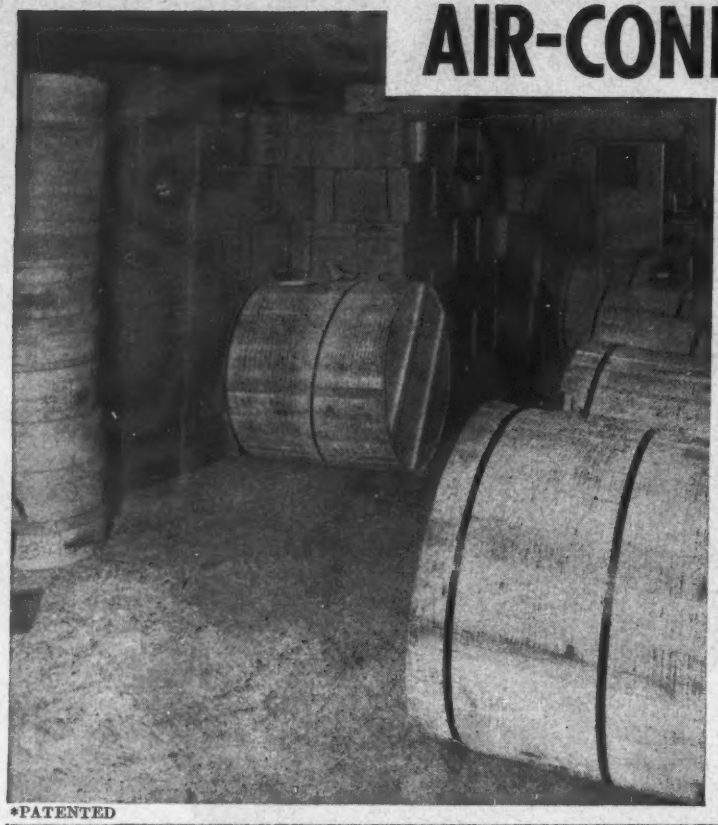

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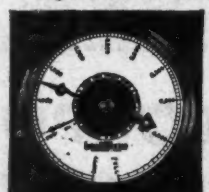

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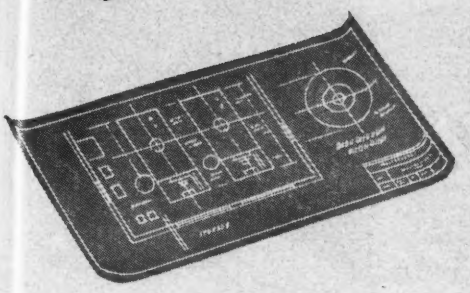

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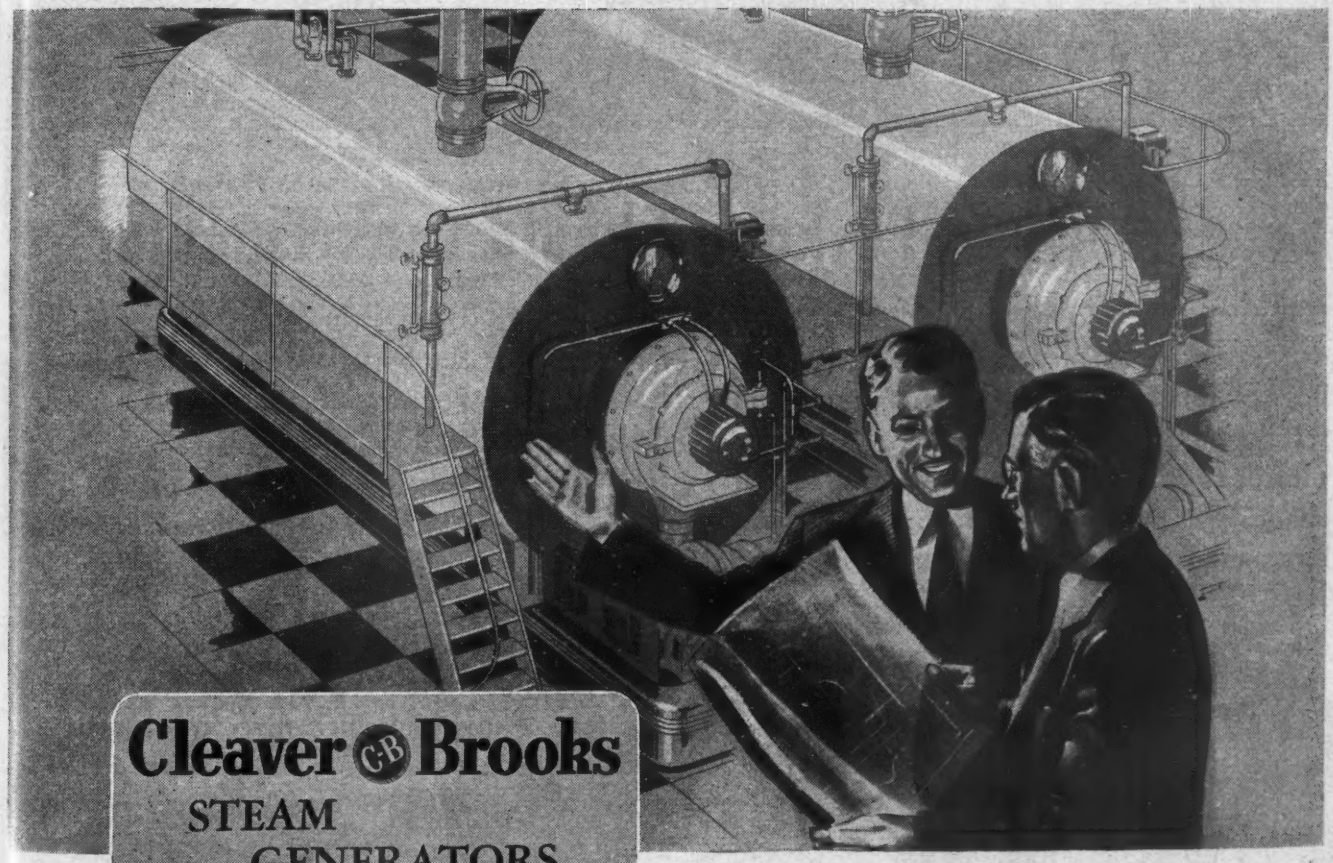

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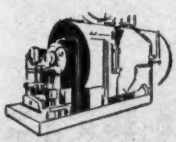
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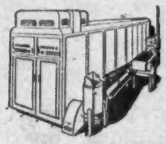
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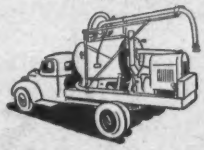
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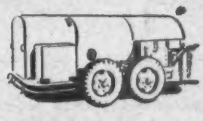
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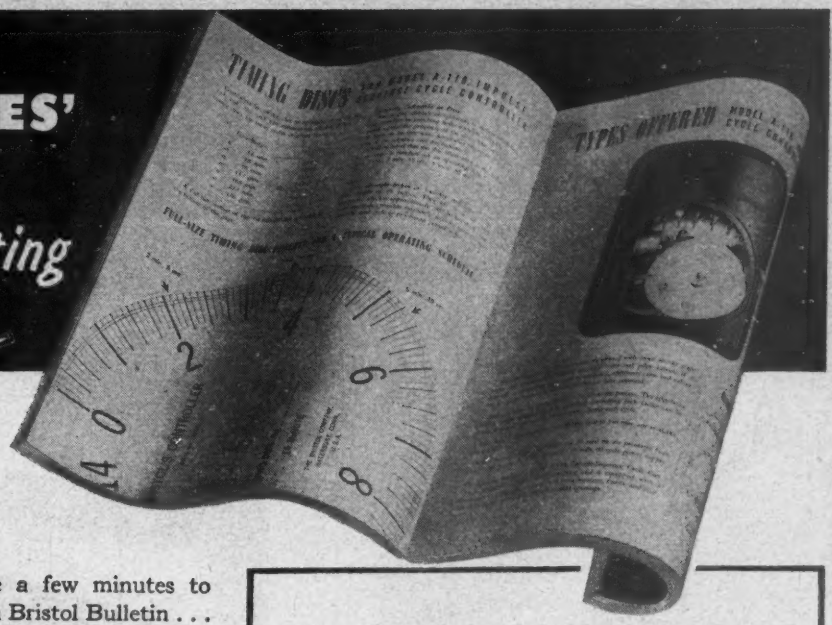
May Help His Fighting



When you take a few minutes to glance through a Bristol Bulletin . . . then write for further facts about Bristol's instrument-engineering in *your* industry . . . you may be taking the first step towards solution of one or more of the fundamental problems facing your plant today. Such problems as these, for instance, have often been solved by a wider, more efficient use of Bristol's automatic controls:—*1. Lack of skilled men . . . 2. Shortage of raw materials . . . 3. Need to increase output without increasing space or equipment. . . . 4. Unnecessary spoilage and rejects . . . 5. Errors in putting new products into production.*

Bulletin 572 — Typical of Bristol's Clear, Up-to-Date, Factual Information on Automatic Control of Mechanical Operations in Industrial Processes

Automatic timing of mechanical operations in industrial processes received its initial impetus when the Bristol Automatic Time-Cycle Controller was developed. Continuous improvements have been made through the years.

Here, in one concise 20-page bulletin, is a complete outline of this "template for efficient operation" — the mechanical operations you can control with it — the results in terms of quality, cost and increased production — details on its operation — and case studies illustrating its application to a wide variety of processes.

Bulletin 572 may point *your* way to a greater production efficiency than you have hitherto imagined possible. Write for it, together with any other bulletins described in the coupon.

THE BRISTOL COMPANY, Waterbury, Connecticut

The Bristol Co. of Canada, Ltd. Toronto, Ontario

Bristol's Instrument Co. Ltd. London, N.W. 10, England

ARMY E NAVY

Engineers Process Control for Better Products and Profits

AUTOMATIC CONTROLLING AND RECORDING INSTRUMENTS

Bristol's Time Cycle Control Speeds Canning and Drying Processes

Automatic changes of temperatures, opening of dampers and valves, *on a pre-determined time schedule,* is becoming increasingly important to wartime canning and dehydration processes, where maximum, uniform production is necessary. Whether on vacuum, compartment or tunnel driers . . . or a series of retorts operated on time schedules . . . Bristol's Cycle Controllers insure exact repetition of best procedures, from beginning to end of the canning or dehydrating process.

FREE Bulletins from Bristol's Library of Engineering Data — One of Them May Help You Increase Wartime Production

THE BRISTOL COMPANY
115 Bristol Road, Waterbury, Connecticut

☐ Please send me Bulletin 572, described above. In addition send me any of the Bulletins checked below.

☐ Bulletin 536 — How to record and control pH value most efficiently with Bristol's potentiometers. Describes advantages of pH control and glass electrode method of measurement.

☐ Bulletin T-302 — How to select and install Bristol's Fully-Compensated Liquid-Filled Recording Thermometers (minus 125° F. to plus 400° F.) with complete facts, nomenclature and typical chart record.

☐ Bulletin 550 — Instruments for Dairy Industries are described in detail, together with installation data for many types of dairy equipments and typical charts for pasteurization, heating, cooling and storage temperatures.

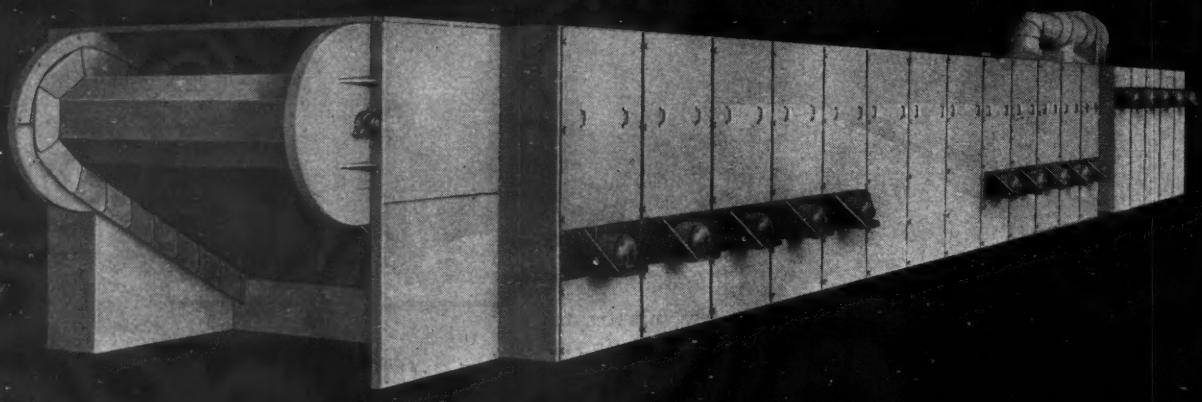
NAME.....

COMPANY.....

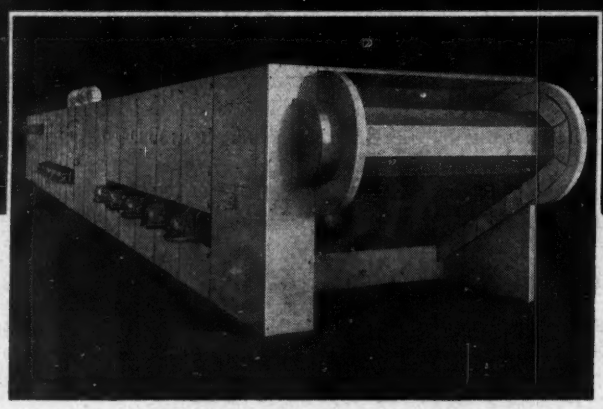
ADDRESS.....

.....

The HUNTER continuous dehydrator



FOR AUTOMATIC,
UNIFORM PRODUCTION



Illustrations show the new HUNTER Continuous Food Dehydrator. It comes completely equipped with all necessary controls for maintaining necessary temperatures and humidity. It is adaptable to continuously dehydrating a wide variety of food products.

The operation of this new, modern HUNTER unit is completely automatic from the time the blanched product is delivered to the feed end of the dryer until the completely dehydrated product is delivered to the proper containers.

For full details on this modern unit write to HUNTER ———

JAMES HUNTER MACHINE CO.
NORTH ADAMS, MASSACHUSETTS
FOUNDED 1847

HEAT-SEASONED MOTOR CASTINGS
to forever insure accuracy of fit and stability of power

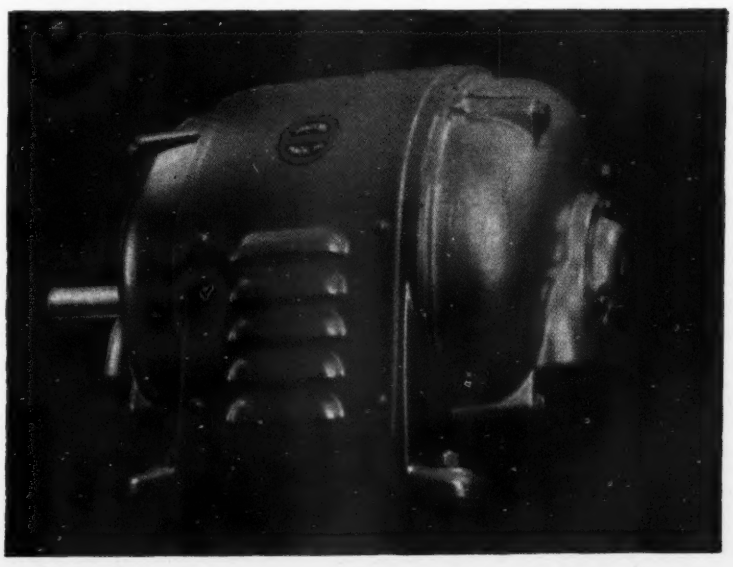
IN ELECTRIC motors one of the principle causes of bearing destruction, electrical losses and vibration is the common failure to *normalize* castings before machining. It has been definitely proved that "green" or "unseasoned" castings will change shape by many thousandths of an inch over a period of time. As little as one thousandth inch in distortion will set up destructive action. This change is attributed to the presence of strains within the metal, due to the rapid and uneven solidification of the metal when cast.

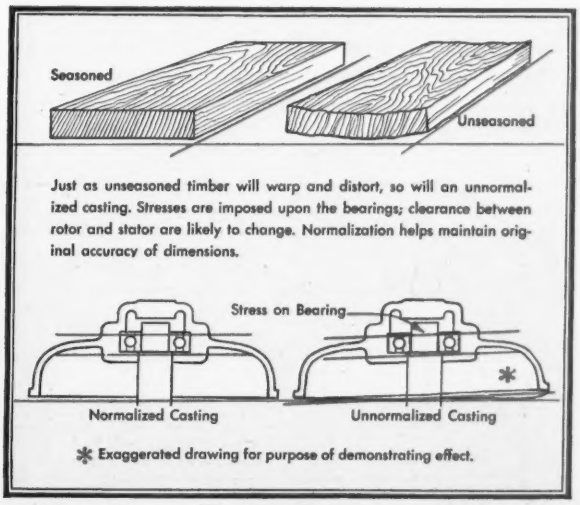
Formerly the only way known to eliminate these strains was to allow the castings to "weather-season" for several months or years before machining. But now, *U. S. Motors* have introduced a positive process of heat-seasoning motor castings, on a large production basis.

Approaching most closely to the point of indestructibility, *U. S. Motors* attain a new standard of accuracy in the use of normalized castings. All U. S. Motor castings are now heat-seasoned before any machine work is performed. This process relieves strains, refines the structure of its metal and tends to eliminate hard spots which would otherwise cause uneven resistance to cutting tools, produce inaccurate work and reduce production efficiency.

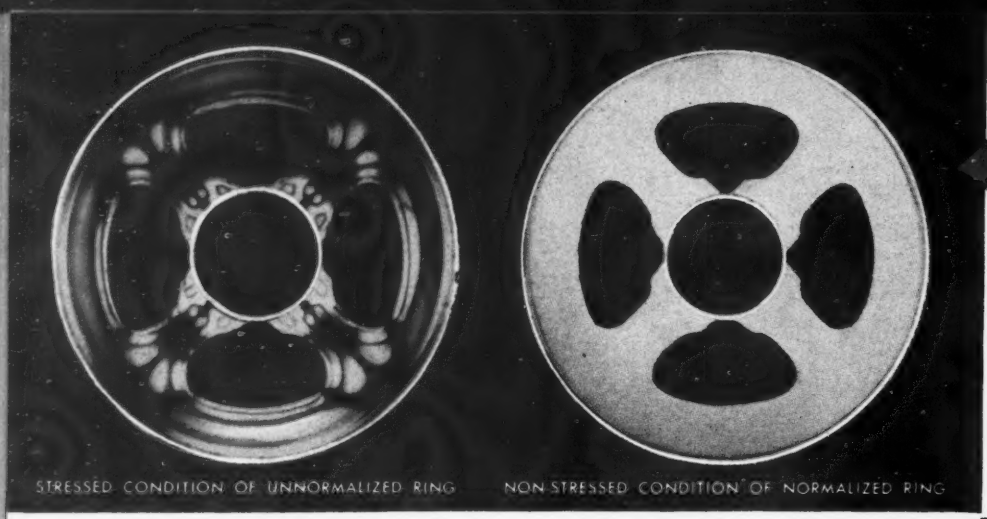
U. S. Motor quality is enhanced, motor performance is improved and the life of the motor is substantially prolonged by the U. S. process of normalization.

Importance of the normalizing procedure is recognized by many industries; for example, production of automotive engines, large telescopes and precision testing machinery. Yet to the best of our knowledge no other electric motor manufacturer has developed similar means of processing castings to insure long life.




Seasoned
Unseasoned
Just as unseasoned timber will warp and distort, so will an unnormalized casting. Stresses are imposed upon the bearings; clearance between rotor and stator are likely to change. Normalization helps maintain original accuracy of dimensions.
Stress on Bearing
*
Normalized Casting
Unnormalized Casting
* Exaggerated drawing for purpose of demonstrating effect.

U.S. MOTORS
STABILIZED WITH NORMALIZED CASTINGS



STRESSED CONDITION OF UNNORMALIZED RING

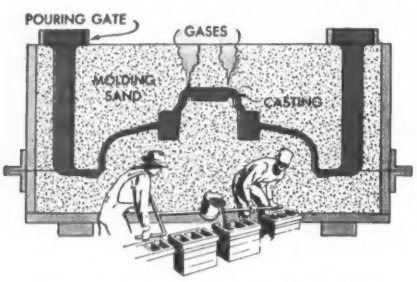
NON-STRESSED CONDITION OF NORMALIZED RING

POLARIZED LIGHT

POLARIZED LIGHT PASSED THROUGH CERTAIN TRANSPARENT MATERIALS REVEALS THE EXISTENCE AND DISTRIBUTION OF STRESS. A MODEL OF A RING WITH FOUR ARMS RADIATING FROM A CENTRAL HUB IS SHOWN AT EXTREME LEFT, IN A STRESSED CONDITION CORRESPONDING TO A CASTING BEFORE NORMALIZING. EACH COLOR FRINGE REPRESENTS A STATE OF STRESS WITHIN THE MODEL. THE UNSTRESSED MODEL CORRESPONDING TO A NORMALIZED CASTING IS SHOWN AT THE RIGHT. REMOVAL OF COLOR FRINGES INDICATE COMPLETE STRESS RELIEF.

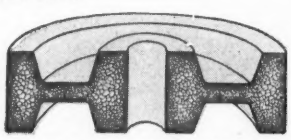
WHY NORMALIZED CASTINGS ARE SO VITALLY NECESSARY

WHEN molten metal flows into the cold mold of a casting, chilling to the state of solidification is never uniform. The grain structure varies. Strains generate. Where the molten iron must flow through restricted passages to reach larger chambers of the mold the temperature is reduced before the metal reaches its destination. The only known way to commercially correct the molecular structure is by normalizing the castings. Normalization involves controlled cooling. It consists of reheating the casting to a temperature above the critical range, holding at that temperature for a certain length of time, and then cooling very slowly and uniformly.



CROSS SECTION OF A MOLD BOX, SHOWING THIN AND THICK CASTING AREAS WHICH COOL UNEVENLY.

The objective toward which *U. S. Motor* engineers point is the production and processing of castings with an equi-balance grain structure; not too fine, not too coarse, but a "happy medium" as well as the elimination of internal stresses. Hence we speak of U. S. Motor castings as having the closest approach to an equilibrium grain structure. To accomplish this we expose the castings to a heat seasoning at the critical temperature for granular readjustment. U. S. die-cast rotors and electrical sheet steel used in the laminations are also heat-treated, to add stability to their structure.



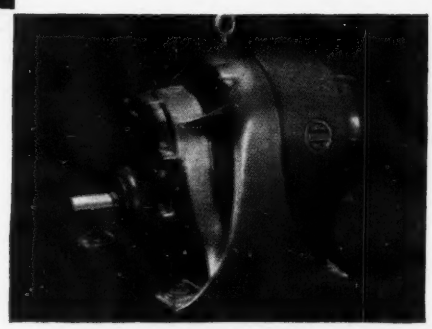
DRAWING DEPICTS VARIANCE OF GRAIN SIZE IN DIFFERENT AREAS OF A CASTING.

All of this sums up to increased motor life. The bearings in U. S. Motors give longer life because there is no distortion set up by improperly seasoned castings. Bearings and rotors are kept permanently aligned. The air gap clearance between rotor and stator is constantly accurate.

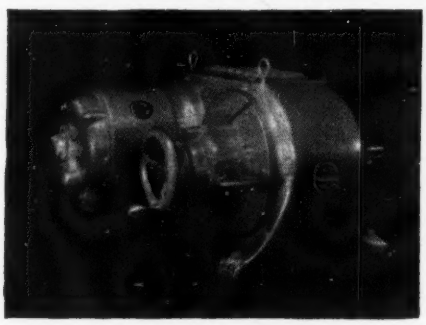
U. S. pioneered the improved appearance of motors by streamlining the design. U. S. developed Asbestos-protection to guard against carbonization of windings. Lubriflush lubrication is a late development in U. S. Motors. So now, in offering normalized castings, U. S. Motors advance still further in the progress of quality without increasing cost to the purchaser.

Ask for Bulletin, "Normalized Castings."

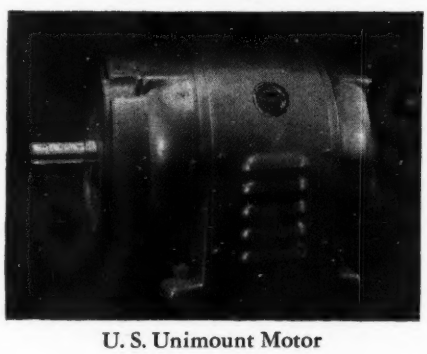
NO WARP — NO STRESS — NO MISALIGNMENT



U. S. Syncrogear Motor, Type GR



U. S. Varidrive Motor



U. S. Unimount Motor

The QUALITY LINE of Power

VARIDRIVE MOTORS	*for infinite speeds*
SYNCROGEAR MOTORS	*for multiplied power*
UNICLOSED MOTORS	*Horizontal and Vertical*
UNIMOUNT MOTORS	*Horizontal and Vertical*
TOTALLY-ENCLOSED MOTORS	*for hazadous services*
AERO-TEST STANDS	*for aircraft servicing*

AUTOSTART *Grinders and Buffers*

U.S. ELECTRICAL MOTORS Inc.

ATLANTIC PLANT: MILFORD, CONN. • PACIFIC PLANT: LOS ANGELES, CALIF.
Assembly Plant: Chicago. Branches: New York, Boston, Pittsburgh, Philadelphia, San Francisco, Seattle. Agents in all principal cities.

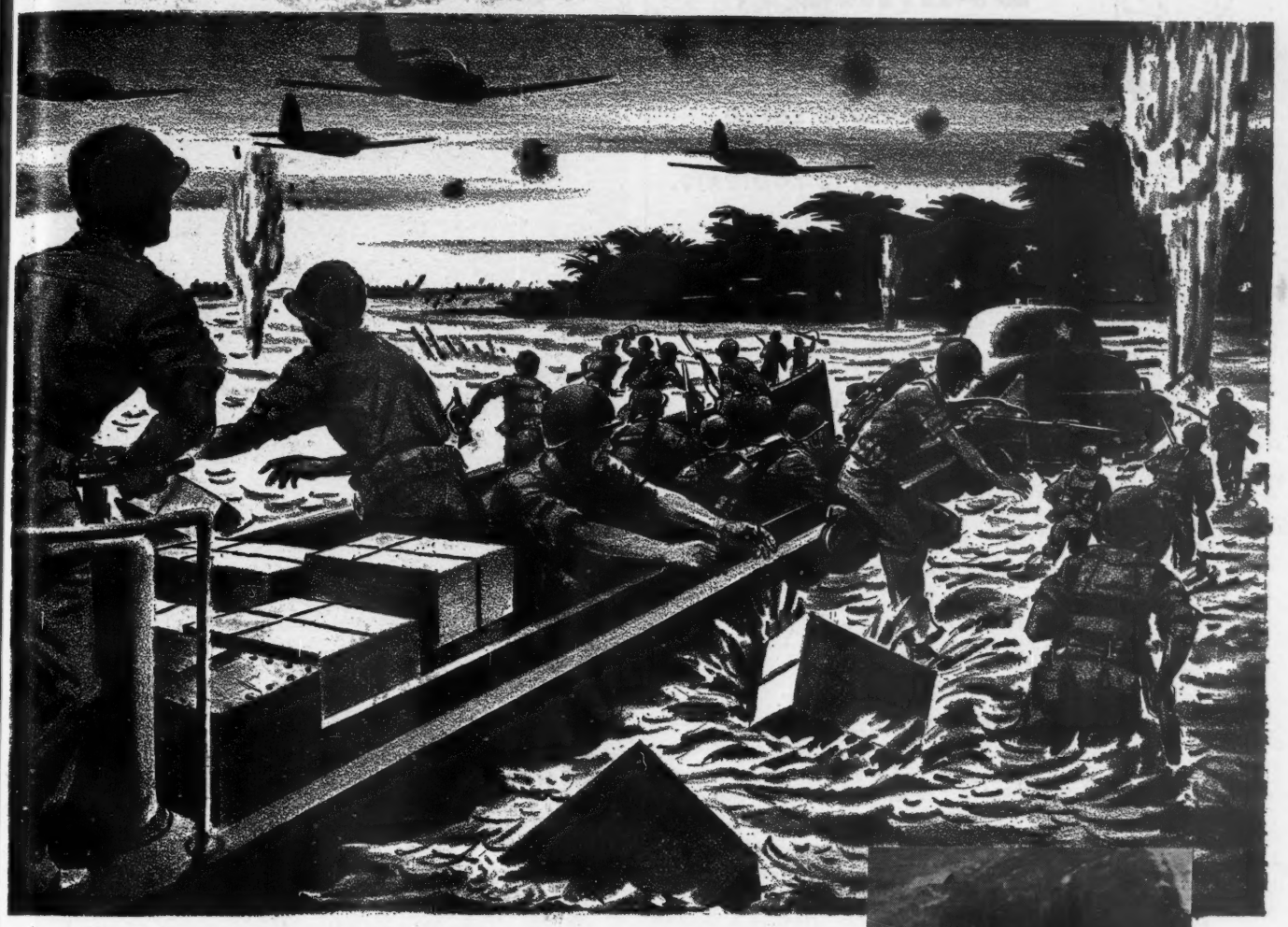
U.S. MOTORS

—embody

ASBESTOS PROTECTION
NORMALIZED CASTINGS
LUBRIFLUSH LUBRICATION

STREAMLINE DESIGN • WEATHERPROOF HOUSING
SOLID DIE CAST ROTORS • INTRACOOLED VENTILATION
AUTOSTART ACTION

GAIR BOXES DELIVER

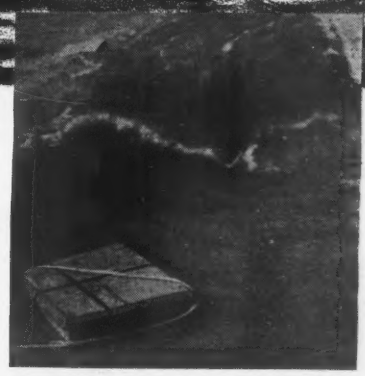


PRECIOUS CARGOES

Gair is working *overtime* on containers for bullets, beans, or bandages—in fact everything essential to win a war.

Containers packed with vital materials for the Armed Forces must be right... Gair makes them so that they will arrive at their secret destination—

WHOLE—DRY—PERFECT—and ready for action.



Write for booklet *showing photographic records of ocean submersion tests made by Gair to meet U.S. Quartermaster Specification No. OQMG-93, Navy Specification 53B11, Lend-Lease Specification FSC-1742-B and FXS-511.*

Robert Gair Company, Inc., New York—Toronto

FOLDING CARTONS · BOXBOARDS · FIBRE & CORRUGATED SHIPPING CONTAINERS

You can depend on DAMROW Tank Engineering

to profitably solve

YOUR Special Container Problems.

DAMROW Custom-Designed tanks, vats, containers of every type, size and shape are on duty NOW in practically every phase of the Food Industry. They're serving many standard and special needs in food processing, storage, mixing, cooking, blanching, handling . . . Serving those needs EXACTLY because of Damrow's long experience in designing the "right tank for the job."

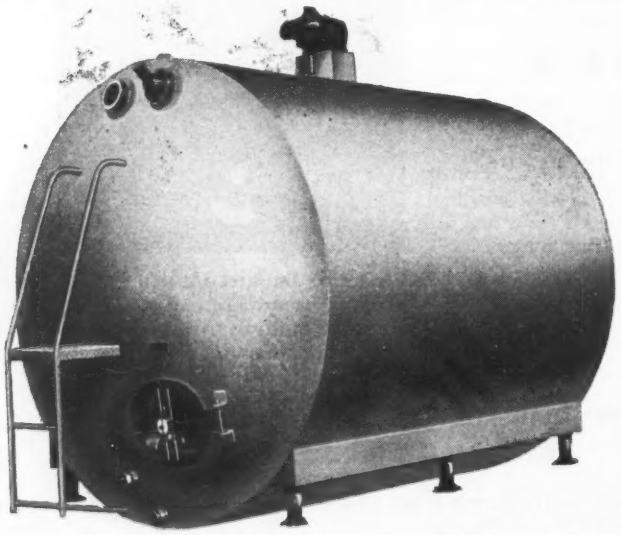
When YOUR processing or production calls for this kind of "Know How" in Container engineering, let us show you how the knowledge, experience and the unusual fabricating facilities at Damrow can work to your benefit. Send a sketch of the tank or vat you have in mind, or outline your problem briefly in a letter. We promise a profitable solution.

DAMROW

"Custom-Designed"

PRODUCTS INCLUDE—

Oval-Round-Rectangular Tanks —Any size—any shape
Stainless Steel Tanks
Galvanized Steel,
Copper Tinned Tanks
Agitator Storage Tanks
Mixing Tanks
Truck Tanks
Vapor-Film Heating Tanks
Stainless Steel Filter Tanks
Kettles, Containers of all sizes and shapes
Jacketed Tanks for indirect Heating & Cooling



Damrow-Built Storage Tanks of Stainless Steel with Agitator.

DAMROW BROTHERS COMPANY
190 WESTERN AVENUE FOND DU LAC, WIS.

CUSTOM—DESIGNERS of Tanks, Containers for all INDUSTRY

ACCORDING TO LEGEND, the first mineral wool was produced during an eruption of the volcano Kilauea in Hawaii. Geological survey revealed this substance to be lava, blown into soft threads by the gigantic forces of the volcano.

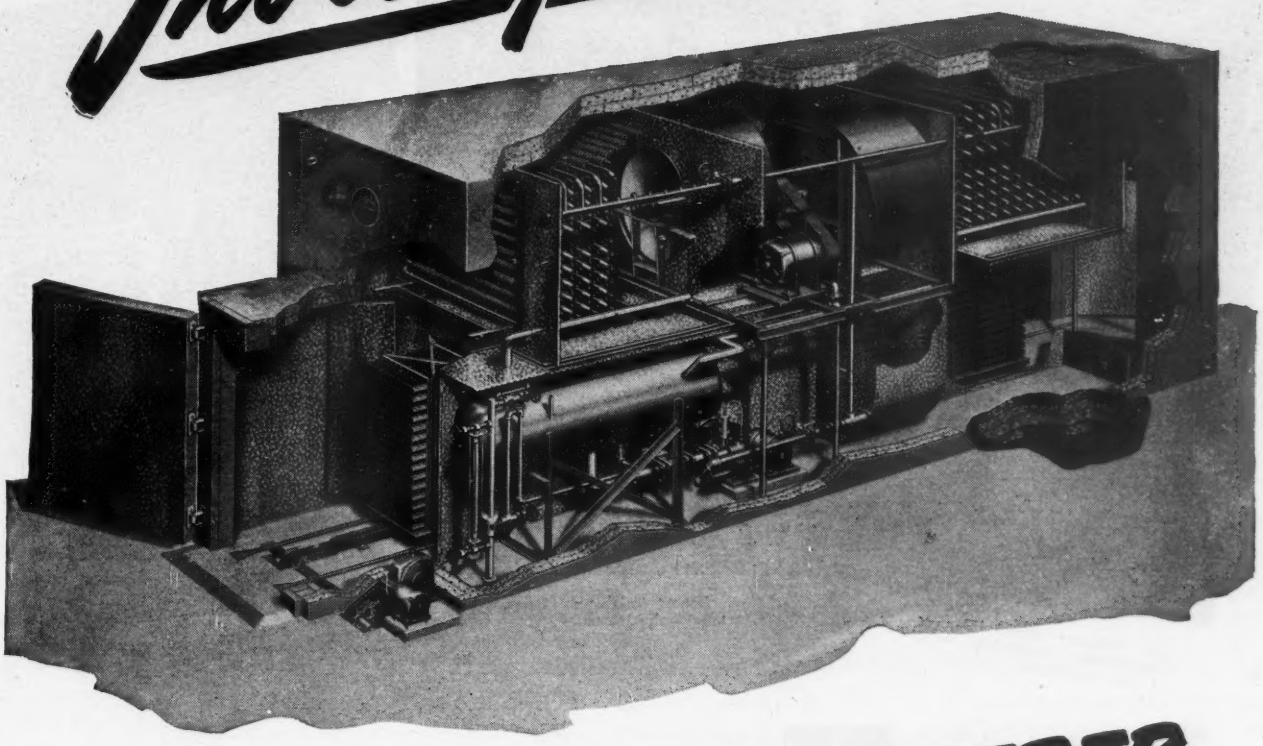
Today, at Johns-Manville factories, in man-made volcanoes, molten silica minerals are blown by means of steam into silky fibers. These mineral fibers are formed into Rock Cork, which is exceptionally efficient for low-temperature insulation. Rock Cork is immune to termites, vermin and mold. It can't rot, does not absorb odors.

Mineral wool is one of four basic materials from which all Johns-Manville products stem: Asbestos, asphalt, diatomaceous earth and mineral wool. Today, Johns-Manville has but one aim: To make these products in the quantities needed to help win the war. Johns-Manville, 22 East 40th Street, New York 16, N. Y.

JM

Johns-Manville
ROCK CORK

Investigate!



THE YORK FAST FREEZER

IN THIS VERSATILE NEW UNIT, York presents the answer to a host of food freezing problems. This new tunnel-type Fast Freezer is designed to handle practically all types of vegetables, fresh fruits, sea foods and poultry. While it is ideal for loose freezing, the unit will handle packages as well. Product and packages may be large or small.

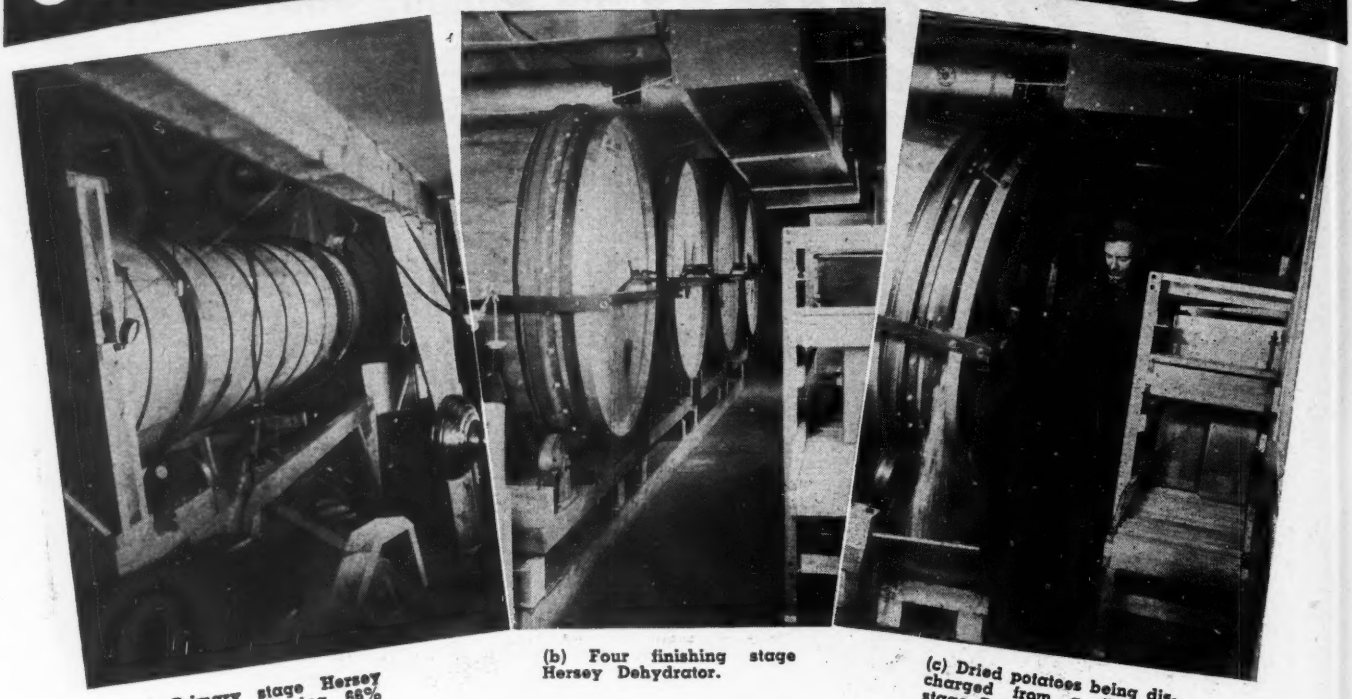
Increased capacity per foot of freezing space is secured through this improved design. Wider fin spacing permits considerable frost accumulation and thus a longer operating cycle is obtained. Hot gas defrosting reduces inoperative time to a new low.

The Fast Freezer is simple in design, compact, economical and dependable in operation. It is available in two sizes, 6 truck and 10 truck, and the 6 truck freezer may be enlarged to the 10 truck size at any time the operator desires increased capacity. Bulletins and specification sheets are available on request. York Corporation, York, Pennsylvania.

YORK REFRIGERATION AND AIR CONDITIONING FOR WAR

HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

Continuous! Automatic! No Labor!



(a) Primary stage Hersey Dehydrator removing 66% of the moisture.

(b) Four finishing stage Hersey Dehydrator.

(c) Dried potatoes being discharged from a finishing stage Dehydrator.

HERSEY
VEGETABLE DEHYDRATOR

For potatoes, carrots, beets and all root vegetables

CONTINUOUS IN OPERATION taking the product in continuous flow from the last washer and discharging without further attention to the packaging room

COMPLETELY AUTOMATIC in movement of product, temperature control and cycle time NO OPERATORS NEEDED

UNIFORM TREATMENT because the product is in motion and is being turned over constantly Every particle receives exactly the same treatment

Constructed of

NON - STRATEGIC MATERIALS such as wood, cast iron, etc., wherever possible

• ***Send for Catalog Today***

HERSEY MANUFACTURING CO.

DRYING ENGINEERS FOR MORE THAN 60 YEARS

381 E STREET • SOUTH BOSTON, MASS.

HIS bulletin shows HOW to END SPILLAGE and BREAKAGE

REX M.E.
REX TABLETOP
WHOSE ACCEPTANCE IN THE CANNING, BOTTLING AND PACKAGING FIELD IS BASED ON PROVED FACTS!
It's Simple — Strong and Easy to Keep Clean
SMOOTH TRANSFER
ACCURATELY BEVELED EDGES PREVENT "JAMMING"!
REX TABLE TOP CHAIN BELT
FOR BUILDERS AND USERS OF BOTTLING, CANNING, FILLING AND SEALING MACHINERY

A smooth surface that's steady and tip-free—that's what Rex Mechanical Engineering—Rex M. E.—accomplished in designing his TableTop Chain Belt. And in his Bulletin No. 393 Rex M. E. tells the story of this remarkable chain belt that practically ends spillage and breakage due to pile-ups.

The bulletin tells of the sturdy simplicity of Rex TableTop Chain Belt—how a one-piece link and pin are the only parts and how, by merely driving out the pin, you can easily remove the link.

It tells how the entire link absorbs the pulling load, eliminating load on the pin when flexing over sprockets—a feature that accounts for the longer life of Rex TableTop.

It mentions the smooth transfer that prevents jamming, how it stays clean longer and is far easier to clean than any other type of chain belt.

Complete engineering facts and data—charts for estimating chain belt pull, sizes, prices and dimensions are additional features of the free illustrated booklet. Write for your copy. Chain Belt Company, 1616 W. Bruce St., Milwaukee 4, Wis.

REX **CHAIN BELTS**

In more than 2000 sizes and types for transmitting power, timing operations, and handling materials

CHAIN BELT COMPANY ***OF MILWAUKEE***

Wire Stitched Shipping Containers Best Protect Your Goods in Transit or in Storage

Bliss Heavy Duty Bottom Stitcher

Latham Bottom Stitcher

Regular Slotted Containers **with bottoms wire stitched are** widely recognized as the strongest, most rigid and dependable containers available. Wire stitching utilizes the entire strength of the board and is unaffected by moisture conditions in storage or transit.

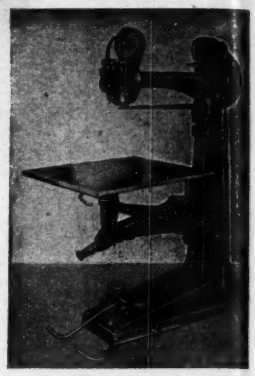
For your stitching equipment, it will pay you to investigate the machines illustrated here, before you buy.

THE BLISS HEAVY DUTY BOTTOM STITCHER is recommended for heavy duty, high speed, continuous production. Favorably known as the fastest, strongest, most durable and dependable Bottom Stitcher built.

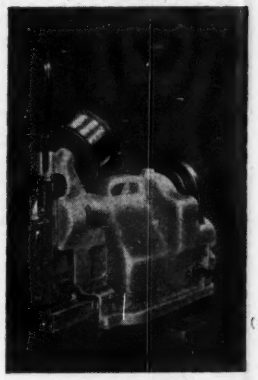
IMPROVED LATHAM BOTTOM STITCHER is a moderate priced machine, recommended for stitching the lighter grades of corrugated and solid fibre containers, in all the usual sizes which do not require the heaviest kind of stitching. Has many features heretofore found only in the highest priced machines.

THE BLISS TOP AND BOTTOM STITCHER. Some products must now be shipped in completely wire stitched containers. This stitcher is recommended for plants or departments where one machine will handle the quantity of bottom and top stitching needed. Quickly changed for bottom or top stitching. Counterbalanced table for easy raising and lowering.

FOR STITCHING FILLED BAGS, the Boston Portable Bench Stitcher has been found practical and convenient, as it can be readily moved to the work to be stitched. Operates from light socket—solenoid operated foot pedal.



Bliss Top and Bottom Stitcher



Boston Portable Small Bag Stitcher

ASK FOR LITERATURE ON ANY OF THESE MACHINES

DEXTER FOLDER COMPANY

330 West 42nd Street, New York

Chicago — Boston — Philadelphia — Cincinnati

Something New in Steam Generators

THE O&S *Powermaster* UNIT

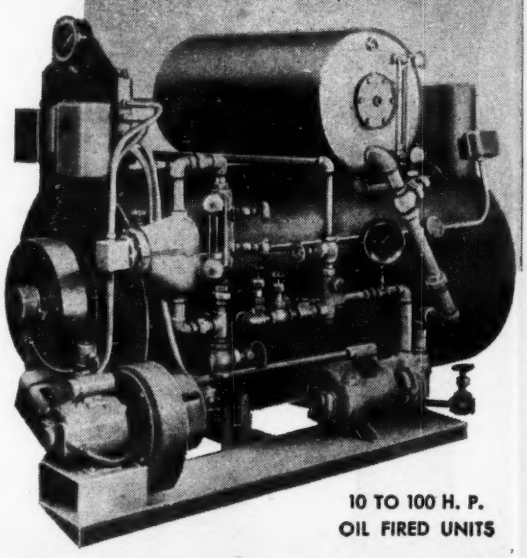
FOR THE FOOD INDUSTRY!

Designed for fast, efficient steam production, the new fully-automatic "Powermaster" is a complete, "packaged" unit. Compact. Lightweight. Easy to install. Easy to clean. And exceptionally speedy — developing 100 lbs. pressure from 60° water in 18 minutes or less!

Backed by more than a half-century of engineering skill and craftsmanship, the new "Powermaster" offers a new "high" in safety, cleanliness and low-cost fuel consumption. Such advantages—which resulted in its use by the Army, Navy and Pan American Airways — can be gained by plants with an AA-2 priority, or better. But in any case, investigate *now* its wide possibilities in your plant.

Get Powermaster Bulletin No. 1213 . . .

It gives you complete information on this new O & S Steam Generating Unit. Your copy will be promptly mailed, without obligation. Write now to ORR & SEMBOWER, INC., 932 MORGANTOWN ROAD, READING, PA.



10 TO 100 H. P.
OIL FIRED UNITS

ORR & SEMBOWER INC. O&S *Builders of Better Boilers Since 1885*

READING . PENNSYLVANIA

Standard Line

FOOD JARS

Glass packaged foods really sell fast. Now there is more reason than ever to pack in glass . . . Uncle Sam has requested it. The new Foster ★ Forbes standard line of jars have smaller closures to save much needed metal . . . are lighter in weight to conserve glass and minimize shipping costs . . . are made in a range of sizes ideal for salad dressings, nut butters, preserves, pickles, fruits, vegetables, etc. If you are going to pack in glass . . . jars or bottles . . . get in touch with us for samples and prices.

FOSTER★FORBES

GLASS COMPANY

MARION, INDIANA, U. S. A.

GLASSWARE OF QUALITY AND CHARACTER

SALES REPRESENTATIVES

KANSAS CITY · DETROIT · CHICAGO · CLEVELAND
MILWAUKEE · CINCINNATI · LOUISVILLE · ST. LOUIS
ATLANTA · ST. PAUL · NEW YORK · MEMPHIS
HAVANA, CUBA

NO METAL REQUIRED

FOR THIS 30-LB. INSTITUTIONAL PACK OF PRESERVES

Cellophane Bag-in-Box releases vital metal for armed forces

The J. M. Smucker Co. report that the Cellophane bag-in-box container illustrated is doing an excellent job in replacing the metal containers formerly used for their institutional packs of Strawberry Preserves and other similar products.

Structural strength is provided by the fibreboard carton. The sturdy Cellophane bag offers ideal protection for the product. The units are easy to handle in the filling, loading and unloading operations.

These new Cellophane bag-in-box containers are adaptable to many kinds of foods, such as preserves, jellies, jams, pie fillings, lard, frozen fruit, frozen eggs and dehydrated foods. They are extremely practical and economical as well.

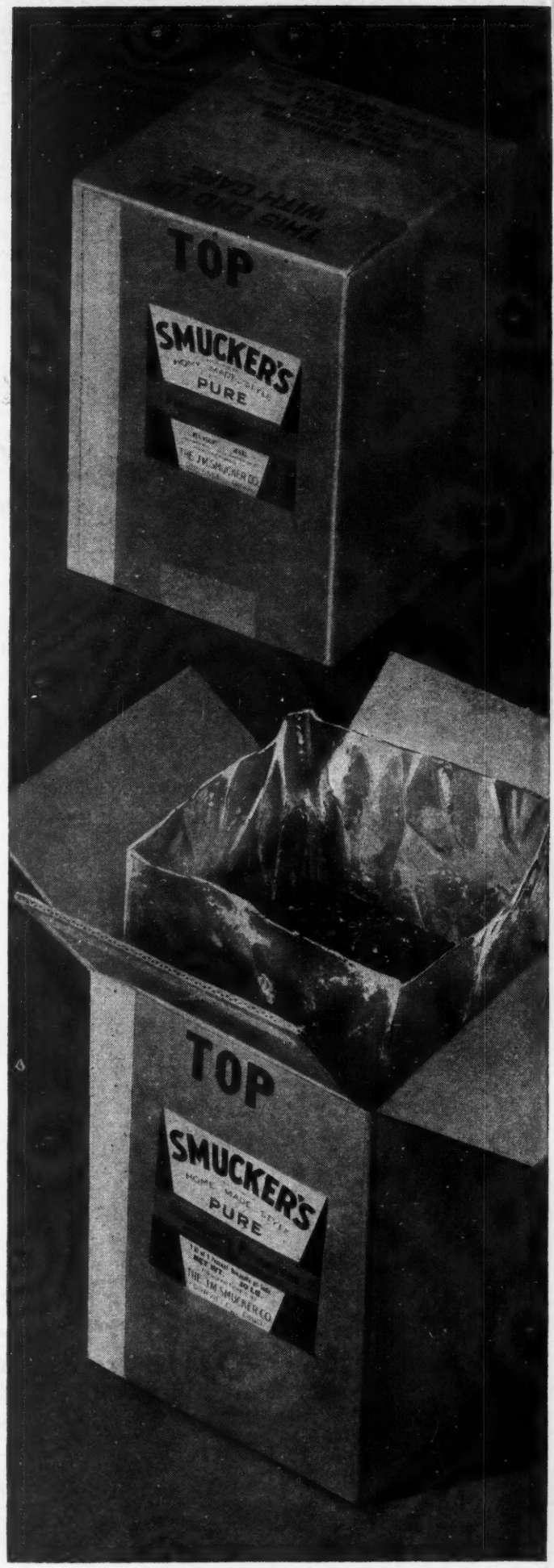
If you have a metal replacement problem, why not check on the possibilities of the Cellophane bag-in-box. Just write E. I. du Pont de Nemours & Co. (Inc.), Cellophane Division, Wilmington, Del.

DU PONT
REG. U.S. PAT. OFF.

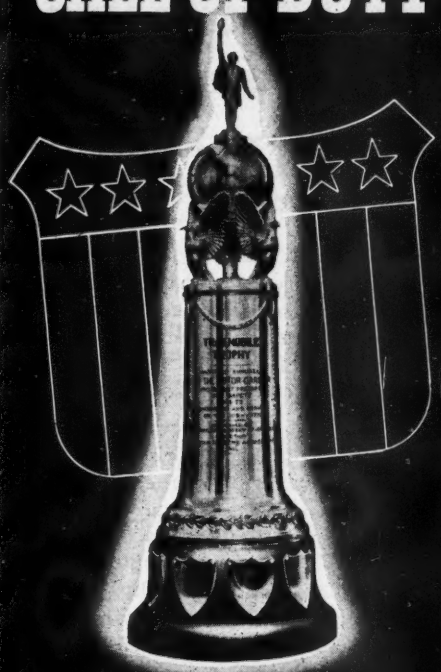
Cellophane

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

BACK THE ATTACK WITH WAR BONDS



FOR SERVICE ABOVE AND BEYOND THE CALL OF DUTY ★



ANNOUNCING THE SIXTH ANNUAL TRAILMOBILE TROPHY AWARD AUGUST 1, 1943 · · · JULY 31, 1944

Presented to the trucking company with the best record of Safety, Service, Load-planning Improvement, and Preventive Maintenance.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

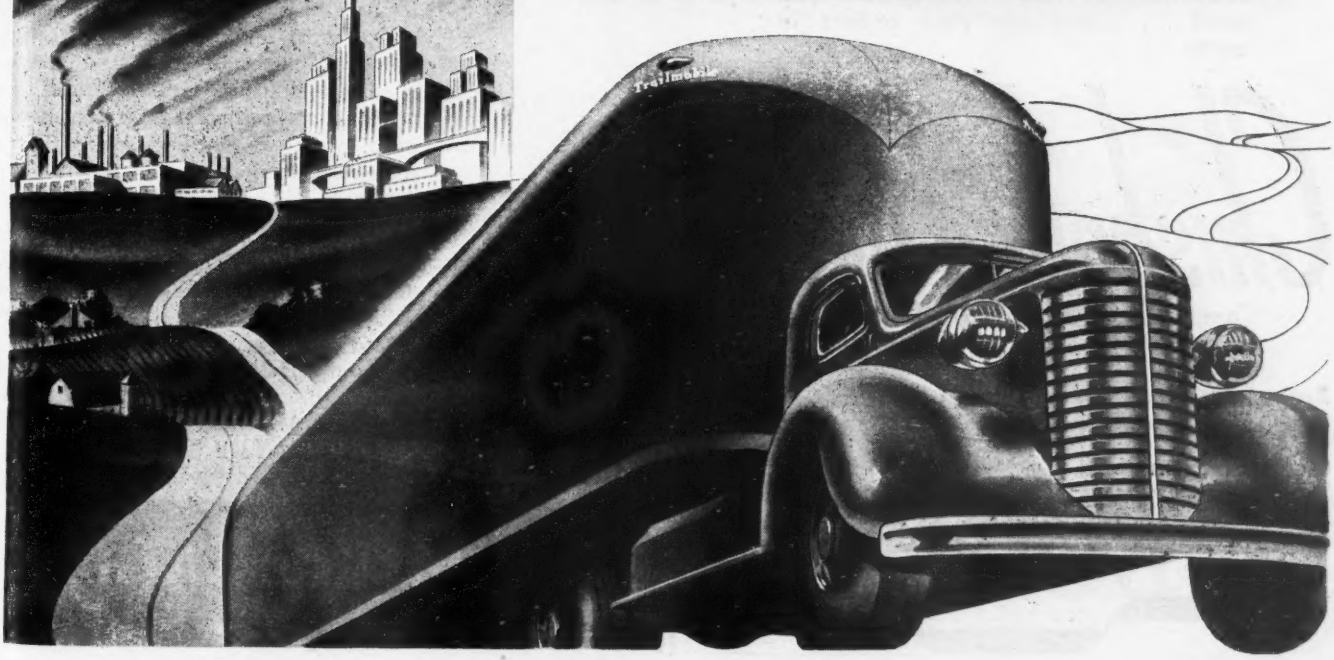
To promote safer, more efficient, more profitable highway transportation, The Trailer Company of America each year makes an award to the company showing the best record of safety in the operation of their equipment. This includes compliance with all state legislation and safety regulations, training of personnel, maintenance of equipment, and service rendered to the public on the highway. As stipulated in the contest rules last year, reports and supporting data on **Safety** and **Service, Load-planning Improvement,** and **Preventive Maintenance** must be submitted to the American Trucking Association in Washington, D. C. Qualified members of A. T. A. are the sole judges of the winner and Honorable Mention awards.

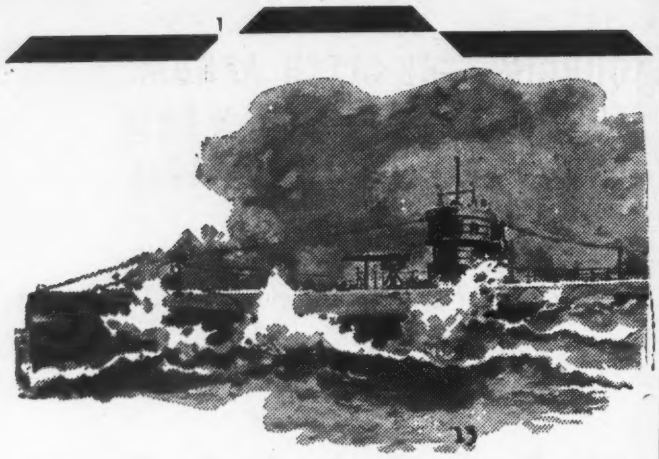
The Trailer Company of America invites all carriers, large or small to enter this contest. All participating operators who maintain their equipment in accordance with the contest rules are assured of a definite reward, in terms of better service, public confidence, reduction of repair costs . . . and ledger sheets showing a profit.

The Trailer Company of America today is devoting the major part of its facilities to war production. New Trailmobiles, patterned from the grim demands of "get it there" war transportation requirements embody many new features of design. New commercial trailers, incorporating these features, may be available for civilian use in the near future. See your nearest Trailmobile distributor or branch for information.

Write today for the "HOW TO WIN" folder, addressing the American Trucking Association, Inc., Washington, D. C. or The Trailer Company of America, Cincinnati, Ohio.

TRAILMOBILE





AT THE FRONT

Food Must Keep Up With the Advancing Forces

For the Fighting Forces . . . for the released people of Axis conquered nations . . . and on the home front, food is needed in ever-growing quantities.

It's the job of the Canners to supply this food . . . to double and quadruple their production for 1944.

It's the job of CRCO to supply the new equipment that will make this huge increase in output possible.

Right now, CRCO is working on the equipment needed for the 1944 pack. Check over your requirements and get your orders in early.

Send for Catalog or Special Bulletins showing the type of equipment you need . . . and get your orders in early.

Chisholm-Ryder

Company, Incorporated
NIAGARA FALLS, N.Y.

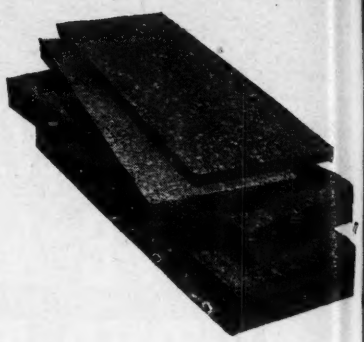
Branch Office and Warehouse
COLUMBUS, WISCONSIN

CRCO REPRESENTATIVES: A. K. Robbins & Co., Inc., Baltimore, Md.; Jas. Q. Leavitt Co., Ogden, Utah, and Seattle, Wash.; Lenfestey Supply Co., Tampa, Fla.; L. C. Osborn, Harlengen, Tex.; W. D. Chisholm, Niagara Falls, Canada.

THE BEST OF *Everything* FOR THE CANNER

A-2

How To Build ECONOMY INTO YOUR COLD ROOM



Specify NOVOID CORKBOARD to Cut Operating Costs.. Conserve Refrigerating Equipment

Now that cork is 100% available . . . without restrictions . . . you can again build *thrift* and *economy* into your cold room installations with Novoid corkboard, cork covering, and cork fitting covers. Here's why:

Novoid cork insulations are manufactured from pure cork granules, and *no other material can equal cork as an all-around insulation.* Cork provides unusually low thermal conductivity, high moisture-resistance, durability, light-weight, strength, rigidity, and fire resistance. It can be erected quickly, without use of metal lath or lumber.

When you specify Novoid corkboard, it's your assurance of economical service. Because corkboard holds temperatures at the desired level, compressors and other refrigerating equipment operate less, and consequently operating costs are lower. In addition, these shorter operating hours mean practical conservation of hard-to-replace equipment.

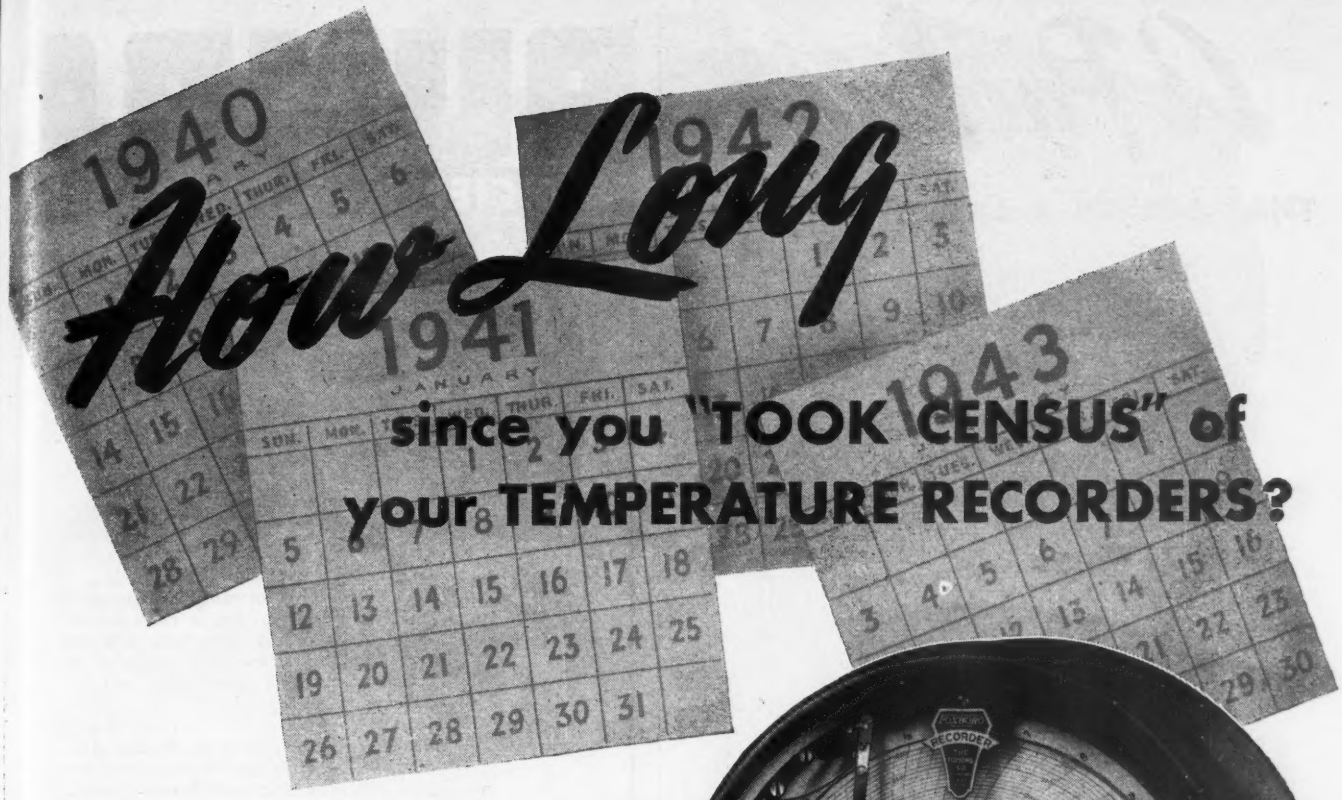
NOVOID MINERAL WOOL BOARD

If you're working on a limited budget, be sure and get all the facts on Novoid Mineral Wool Board. Mineral Wool Board equals or exceeds Federal Specification HH-M-371 for block or board insulation. Write today to Cork Import Corporation, 330 West 42nd Street, New York City.

NOVOID INSULATION

Corkboard • Cork Covering • Mineral Wool Board

How Long since you "TOOK CENSUS" of your TEMPERATURE RECORDERS?



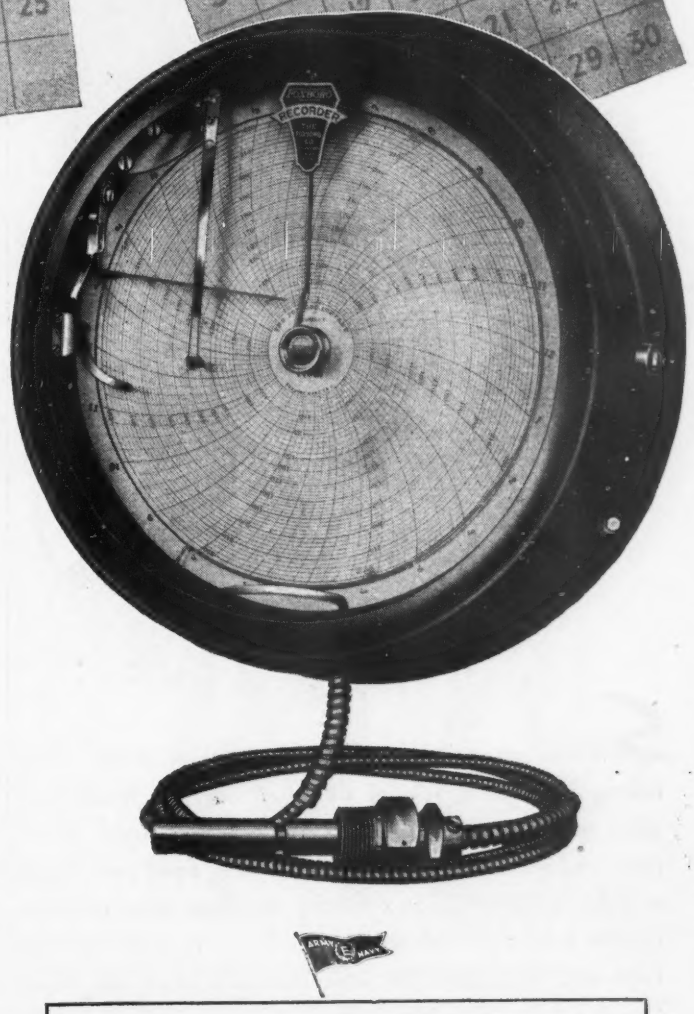
Now's the time to check up whether you've been overlooking important installations

Have you had a chance since pre-war days to survey your whole plant set-up with a view to getting *all the help you can* from Temperature Recorders? If not, you may be surprised to find how much your overall production can be improved by equipping a few neglected points with Foxboro Temperature Recorders.

These precision-engineered instruments give unerring guidance that eliminates any need for guesswork in controlling critical temperatures. Their ultra-sensitive thermal system reacts to slightest changes . . . their light, strong recording mechanism "writes it down," instantly and continuously, without loss of accuracy.

No matter what step in your operation demands uniform temperature, Foxboro Temperature Recorders will automatically give you the exact information to save quality-variations, spoilage, re-runs and lags in output.

Why not make a list *right now* of the trouble-spots that Foxboro Temperature Recorders might eliminate once and for all? Write for detailed Bulletin 198-2. **The Foxboro Company, 30 Neponset Avenue, Foxboro, Massachusetts, U. S. A.**



TEMPERATURE RECORDERS

by

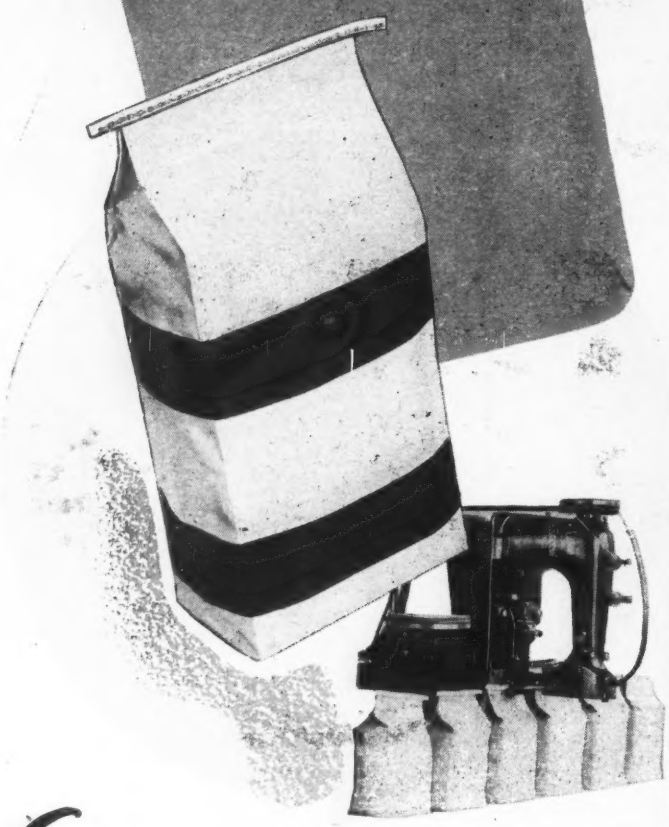
FOXBORO

REG. U. S. PAT. OFF.

A Package

THAT SOLVES A LOT OF PROBLEMS

- Does not require critical materials
- Simplifies production
- Economical to produce
- Saves labor
- Attractive, neat, durable



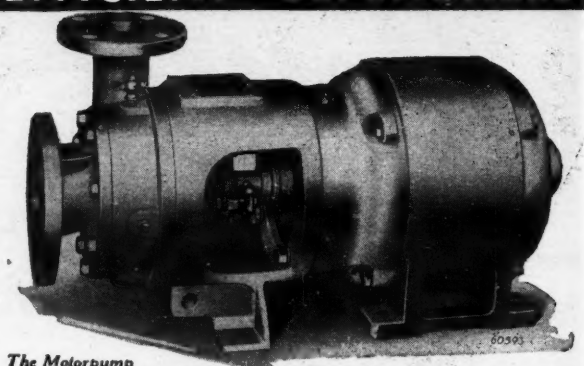
SMALL paper bags, easily obtainable, closed after filling by Union Special *60000 C* Sewing Heads are ideal packages for grocery staples, flour, sugar, powders, chemicals, dehydrated foods, dog food and a host of other products. The *60000 C* machine automatically applies a tape to each side of the bag top, sews through tape and bag, clips the tape between bags and trims the bag top. Matches output of fastest filling equipment. A modest investment. Nothing else like it. Write for details. UNION SPECIAL MACHINE COMPANY, 450 N. Franklin St., Chicago 10, Illinois.

Union Special

Bag Closing Machines

PUMPS

EFFICIENT—DEPENDABLE



The Motorpump for capacities to 1800 gpm.

The Cameron Motorpump is a compact unit with a built-in motor that can be installed practically anywhere without a special foundation. It's available in capacities from 5 to 1800 gpm and for heads to 500 ft.

Other pumps in the Ingersoll-Rand line range in capacity up to 100,000 gpm and in pressure up to 3,000 lbs. per square inch. Ask the Ingersoll-Rand branch near you for complete information.

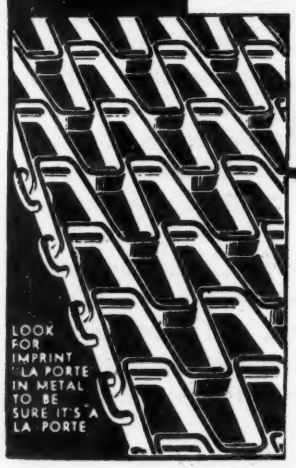
9-254

Ingersoll-Rand

CAMERON PUMP DIVISION
11 Broadway, New York, N. Y.

Keep VICTORY Food Products MOVING ON LA PORTE

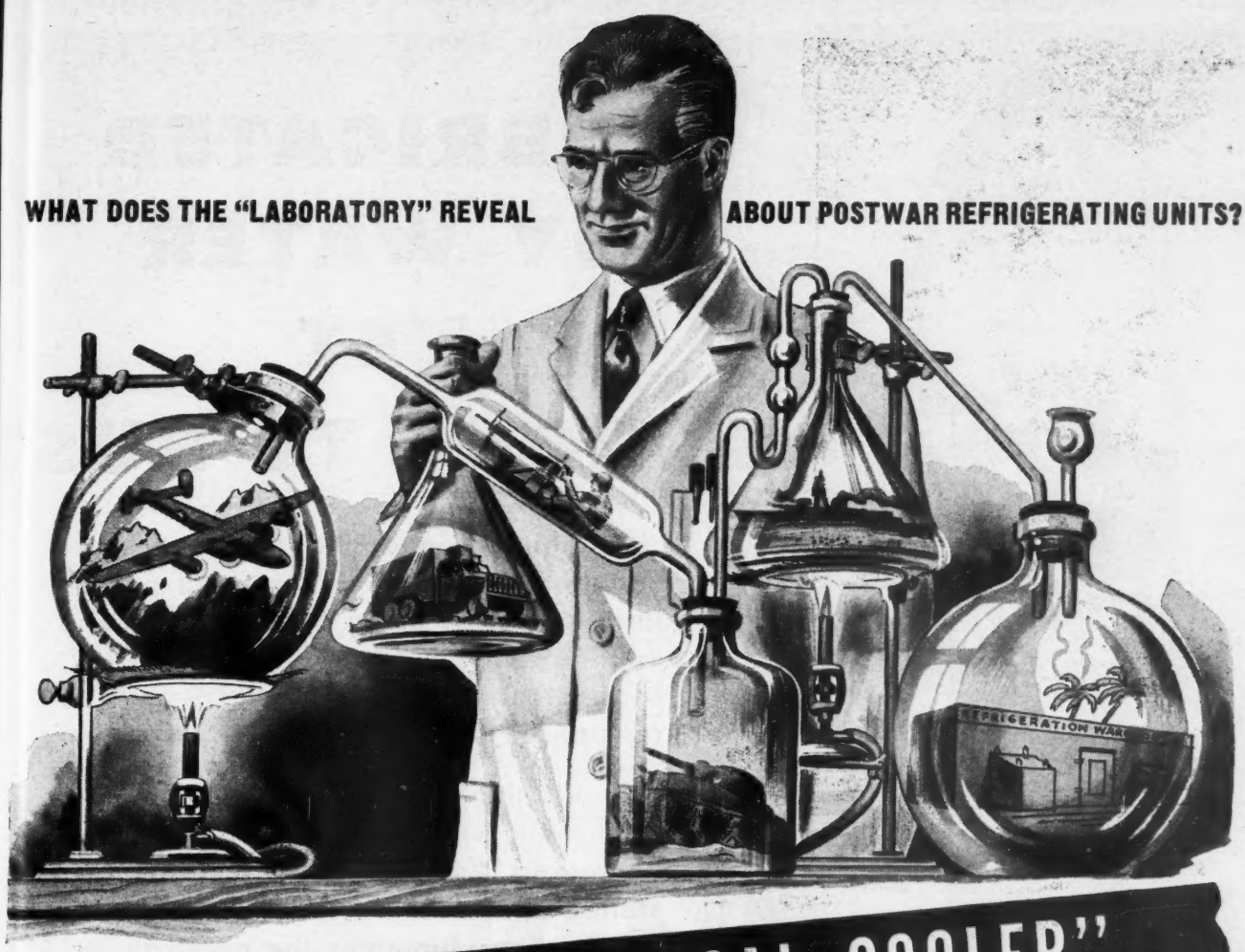
FLEXIBLE STEEL CONVEYOR BELTING



Every conveying operation in the processing of Cold Pack, Hot Pack, Sugar Preserved, Dehydrated and Smoked foods can be handled faster, better and cheaper with LA PORTE Conveyor Belting. It withstands all impacts at the loading chute. It resists heat and cold. It will not stretch, creep, weave, nor jump. It will not deteriorate while not in use. And, in addition, it requires no dressing or special maintenance to keep it at top efficiency. Easily sterilized with a steam gun or scalding water right on the friction drum.

Ask your Supplier TODAY for LA PORTE Conveyor Belting—in Galvanized Steel—available in any length and practically any width.

LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA



"LET'S ASK UNIVERSAL COOLER"...

JOHNNY DOUGHBOY'S "tests" of Universal Cooler workmanship and materials, under all imaginable conditions on world battlefronts, are being recorded for reference and action when production of refrigeration units is resumed for the better living to which all America is looking forward. Already much of this vital information is available to you, for your postwar planning, when you *"ask Universal Cooler."*

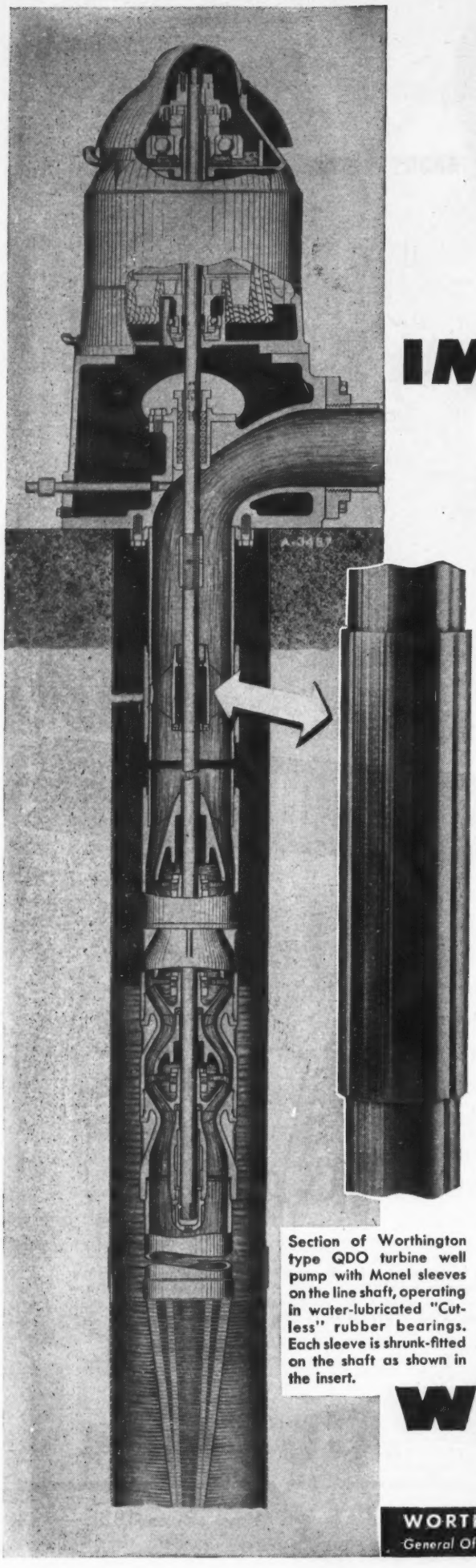
WRITE TODAY—our expanded research-engineering is prepared to handle your inquiry regarding refrigeration units for: Frozen food cabinets • Food storage refrigerators and display cases • Ice cream cabinets • Water and/or beverage coolers • Commercial refrigeration equipment • Air conditioning • Machine tool cooling equipment • Other applications you're planning. – *REFRIGERATION IS OUR BUSINESS!*

UNIVERSAL COOLER

WE SELL TO MANUFACTURERS ONLY

UNIVERSAL COOLER CORPORATION • *Automatic Refrigeration since 1922*

MARION, OHIO • BRANTFORD, ONTARIO



Section of Worthington type QDO turbine well pump with Monel sleeves on the line shaft, operating in water-lubricated "Cutless" rubber bearings. Each sleeve is shrunk-fitted on the shaft as shown in the insert.

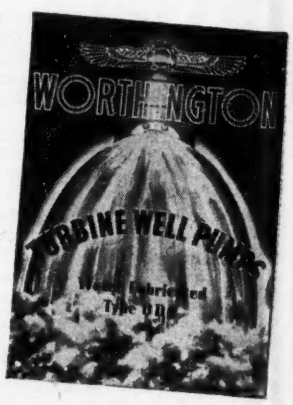
LUBRICATED BY WATER YET IMMUNE TO RUST

Worthington guards against corrosion and abrasion in its turbine well pump installations by using Monel sleeves on the line shafts at every bearing, to combine strength and toughness with resistance to corrosion and abrasion.

In Worthington water-lubricated turbine well pumps Monel shaft sleeves operate in "Cutless" rubber bearings installed at 10 foot intervals. This type of construction eliminates the necessity for a line shaft made entirely of a costly non-corrosive alloy metal.

In the Worthington turbine well pump line there is a type to meet YOUR requirements, whether your conditions call for water or oil lubrication.

These units are the product of the WORLD'S LARGEST PUMP BUILDER . . . one of America's pioneers in deep well pumping equipment.



FOR FULL DETAILS SEND FOR BULLETIN H-450-B29

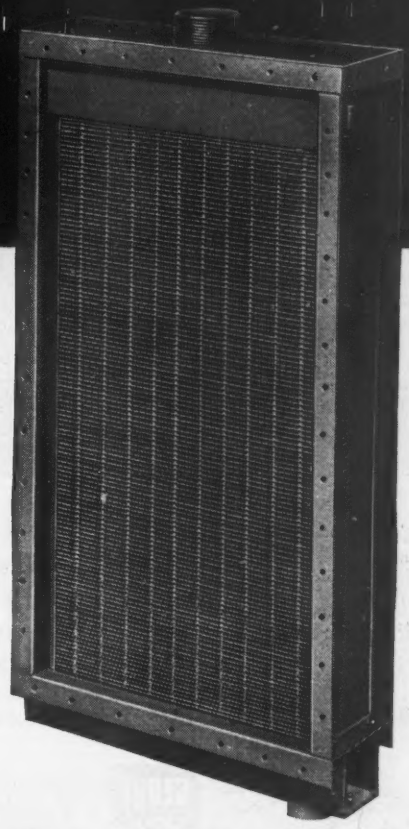
WORTHINGTON

DW3-9

WORTHINGTON PUMP AND MACHINERY CORPORATION

General Offices: HARRISON, NEW JERSEY • *Offices and Representatives in Principal Cities*

modine
BLAST HEATERS



IN YOUR DEHYDRATOR TUNNELS

In selecting dehydrator tunnel equipment, particularly blast heaters...Modine sound design and engineering...backed by Modine's recognized reputation and financially solid organization is your safeguard.

Modine Blast Heaters *retain* their original heat transfer capacity. Dipping the fins, tubes and headers in molten lead alloy gives them a coating that resists rust. *Permanently bonding* tubes to fins *with metal* seals the all-important contact of fin collar to tube wall against corrosion. Tubes are *ingot iron,* with walls *.065" thick.* Casings are heavy steel channels, *Parker-Bonderized* against rust, and painted.

Sizes and fin and tube combinations to meet your most exacting heat transfer requirements.

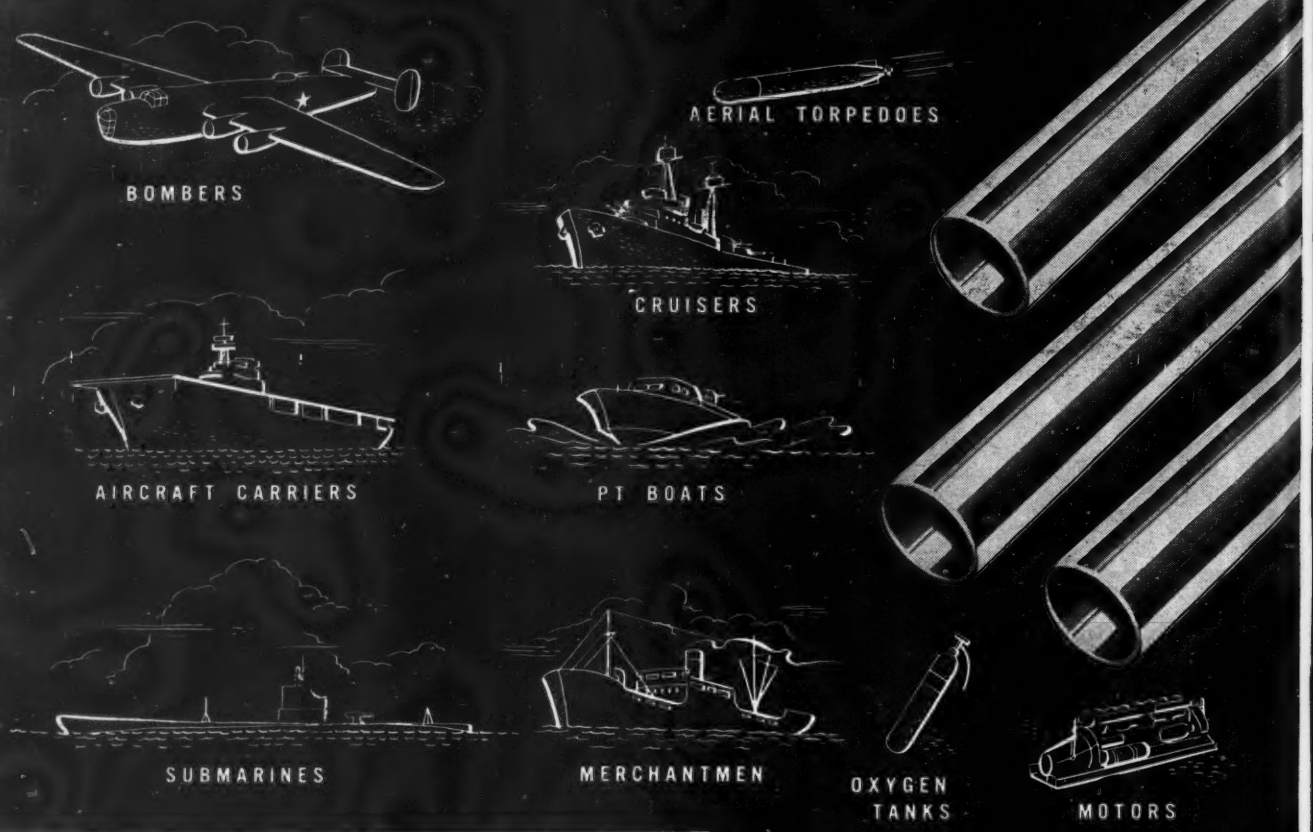
GET BULLETINS 342 AND 342-A

Look in your phone book for Modine representative's name —"Where to Buy It" section.

MODINE MANUFACTURING COMPANY
1822 RACINE STREET, RACINE, WISCONSIN

MEMBER OF NATIONAL DEHYDRATORS ASSOCIATION

GLOBE STEEL TUBES



Strength with minimum weight — uniformity of structure and characteristics — easy machine-ability — adaptability to a wide range of needs — these are a few of many advantages of Globe Steel Tubes that have given them an important place in the construction of all types of military equipment.

GLOBE STEEL TUBES CO. · Milwaukee 4, Wisconsin

- Boiler & Pressure Tubes
- Condenser & Heat Exchanger Tubes
- Mechanical Tubing
- Stainless Tubes (Seamless)
- Stainless Tubes (Seamless)
- Glaweld Tubes (Welded Stainless)
- Globeiron Tubes (Seamless Pure Iron)

GLOBE TUBES

Carbon — Alloy — Stainless Steels

BAKER
SINCE 1905
ENDURING QUALITY

ENDURING QUALITY

• When we place the BAKER crest on one of our compressors, it means that it has been tested under actual, individual working conditions and that its pedigree is forever a part of our records.
That is why for 38 years, in 65 countries, BAKER machines have proved that "enduring quality" on our crest means what it says—*dependability*.

BAKER ICE MACHINE CO., INC., OMAHA, NEBRASKA

COMMERCIAL AND INDUSTRIAL REFRIGERATION

BUY MORE BONDS—FIGHT INFLATION

How Cyclone Metal Belts help speed DEHYDRATION

RAPID passage of air around diced vegetables is assured when you use Cyclone Dehydration Belts. For, by far the larger part of the belt area consists of openings—even in the 3/32" mesh illustrated below. Dry, warm air reaches all sides of food particles, absorbs their moisture quickly. Cyclone Belts eliminate many common conveyor belt troubles. Flexible—yet strong. Unharmed by water, steam or temperature changes.

Cyclone Stainless Steel Belts are recommended for food dehydration processes because they resist the corrosive effects of highly humid, hot air and vegetable acids. For other jobs of conveyance the familiar galvanized Chain Link or Flate Wire Belts are recommended.

Free Information. There's no obligation involved in asking for the help of our experienced engineers. So, if you have conveyor belt problems, get in touch with us. We will gladly furnish the belts you need.

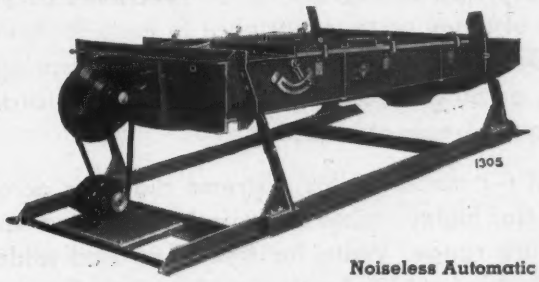
CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
Waukegan, Illinois · *Branches in principal cities*
United States Steel Export Company, New York

USS CYCLONE "Red Top" METAL CONVEYOR BELTS
CYCLONE FENCE DIVISION American Steel & Wire Company
UNITED STATES STEEL CORPORATION SUBSIDIARY

CYCLONE METAL DEHYDRATION BELTS | UNITED STATES STEEL

Cleaner
Grader
Sifter
Bolter
Dresser
EUREKA

4-Motions Excitation



Noiseless Automatic

Snappy Screen

Matchless capacity, efficiency and economy handling hard-to-screen materials . . . Silent, contra-force excitation that screens (or sifts) all bulky, 'fluffy or slow separating materials with amazing rapidity . . . Requires small space, takes little power—easily and cheaply installed . . . Simple—safe for all use . . . Built in several sizes.

Ask for Data 1-404

S. HOWES CO., INC., Silver Creek, N. Y.

MOTOCO
F-1
DIAL
THERMOMETER

How to Simplify Temperature Readings

. . . . . and Save Time and Materials!

TIME IS SAVED . . . when temperature readings can be made at eye level. MOTOCO Thermometers may be mounted wherever observation is most convenient . . . at some distance if necessary from where the temperature is taken.

MATERIALS ARE SAVED . . . when temperature readings are made frequently and systematically. Close observation of processing temperature helps to avoid excessive heating and cooling costs . . . safeguards against spoilage . . . is an important aid in securing consistent quality.

MOTOCO Indicating Thermometers combine absolute accuracy with strong, simple construction . . . the result of many years experience in manufacturing precision instruments. There are no hairsprings, gears or other delicate parts to get out of order or require frequent adjusting.

Model F-1 measures 6½" extreme diameter across face. Has highly visible and evenly calibrated temperature range. Write for free illustrated folder. The Electric Auto-Lite Company, Moto Meter Gauge & Equipment Division, Chrysler Bldg., New York 17, N.Y.

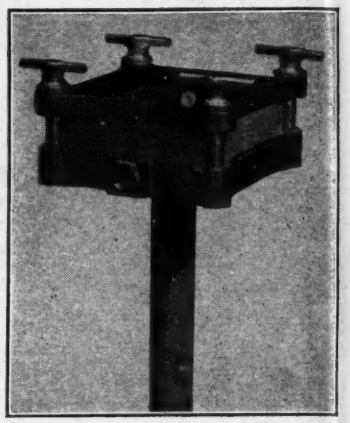
MOTOCO Indicating Thermometers have rigid stems for direct mounting or may be obtained with capillary tubing for remote reading. Model F-1, illustrated, $20. • MOTOCO Recording Thermometers are priced from $31.

MOTOCO

INDUSTRIAL THERMOMETERS

TAKE OUT SOLIDS

with the RAPID FLO LIQUID FILTER



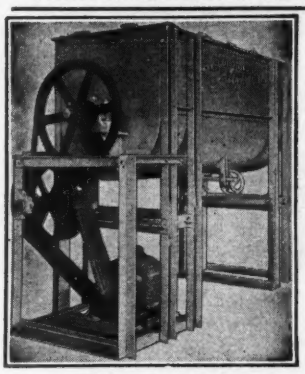
Used for over two years for MILK and WATER, the new Rapid Flo Filter can be used to take out solids from practically any liquids. A head pressure of 15 pounds is sufficient to enable liquid to pass through the special RAPID FLO FILTER. Gravity flow may be used. For quicker filtration a pressure pump feed may be used.

The filter head is made from Ambrac, a solid high nickel content metal. It is rust-proof and corrosion resistant. The filter medium is the Rapid Flo cartridge which is a laminated block about 1½" thick through which at spaced intervals are stretched 20 layers of RAPID FLO long fibred cotton. The RAPID FLO FILTER can be used for vinegar, cider, fruit juices, extracts, alcohol, chemicals, oils and other liquids.

CONSOLIDATED SIPHON SUPPLY CO., INC.

Dept. F, 22-24 Wooster Street New York City

GRUENDLER ENGINEERS are READY to ASSIST YOU



For continuous operation—Effective power transmission arrangement, together with massive bearing supports and foundation. Stainless steel, Monel Metal and non-corrosive Linings on specification.

GRUENDLER "MASTER"

BATCH MIXERS

50 lb., to 4 ton Batch Capacities

• • • with specially designed double spiral agitators for Moist, Dry or Liquid materials, have proven themselves time and again in the war effort and in peace time production.

WRITE for DATA

GRUENDLER CRUSHER & PULVERIZER CO.

PLANT and MAIN OFFICE—2915-17 N. MARKET • ST. LOUIS, MO.

HARVESTING for the winter world

THIS year's harvest must be shared with the whole hungry world. Now, more than ever, the packing industries must make sure that no ounce of wholesome food, no iota of nourishment, is wasted or spoiled.

Leading packers, responsible for thousands of tons of fruits and vegetables, maintain the most rigid standards of cleanliness and purity—absolute freedom from corrosion and metallic contamination—with U·S·S Stainless Steel equipment at every point where food touches metal.

No other metal can cope with so many of the organic acids encountered in high-speed processing of fruits and vegetables, their juices, syrups, jams and jellies.

When you ask packers why they use U·S·S Stainless Steel equipment, you'll get some of these answers:

1. U·S·S Stainless Steel equipment is easily kept immaculately clean. It protects the purity of foods in process. It enables you to meet the most rigid requirements of sanitary inspection laws.

2. Delicate flavors are not affected. Attractive colors, natural taste, vitamin content and keeping qualities of fruits and juices are fully retained by U·S·S Stainless Steel equipment.

3. Canning tomatoes, tomato juice, tomato pulp — and packing catsup involve heavy volume and unusual problems. Leading plants have solved all their tomato problems by using U·S·S Stainless Steel equipment at every stage of the packing process.

4. Concentrated orange juice, grapefruit and lemon juice, formerly considered hard to handle, are now being successfully processed by U·S·S Stainless Steel equipment.

5. Fruit and vegetable juices, syrups and liquids which would quickly destroy other metals are now being handled in seamless tubing made of U·S·S Stainless Steel.

Keep your weather eye on stainless so that, when the time comes, you can take full advantage of its properties, which help you to increase your output, improve product quality — and to lower your costs.

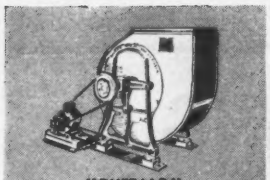
AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

U·S·S STAINLESS STEEL

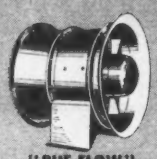
"Be glad it's Stainless... it lasts longer!"

Sheets · Strip · Plates · Bars · Billets · Pipe · Tubes · Wire · Special Sections

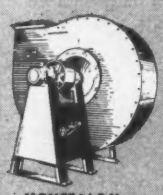
UNITED STATES STEEL



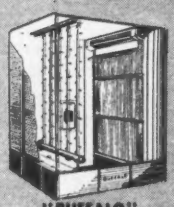
"BUFFALO"
Limit-Load Ventilating Fan



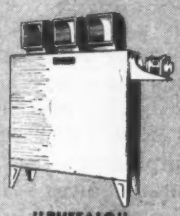
"BUF-FLOW"
Axial Flow Fan



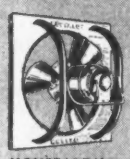
"BUFFALO"
MX Mill Exhauster



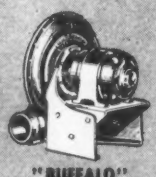
"BUFFALO"
Air Washer



"BUFFALO"
Highbay Unit Heater



"BUFFALO"
Breeze Ventilating Fan



"BUFFALO"
Type E Blower

"BUFFALO"
Volume Fan

Helping put BETTER foods ... in SMALLER packages

"Buffalo" FANS

FOR DEHYDRATION

• Advanced ideas in dehydration stimulated by war necessity, are bringing to our Armed Forces and the civilian population alike something *really* new in foods. No substitutes these! Rather do they mark the rise of an important new era in food processing, packaging and economical distribution.

Collaborating with the designers of modern new dryers, Buffalo engineers are helping point the way to fan equipment best adapted to fast, effective dehydration. In many of today's newest plants—as in so many older ones—Buffalo Fans are dependably serving vital wartime food production.

Look to "Buffalo"—for an answer to your fan problem!

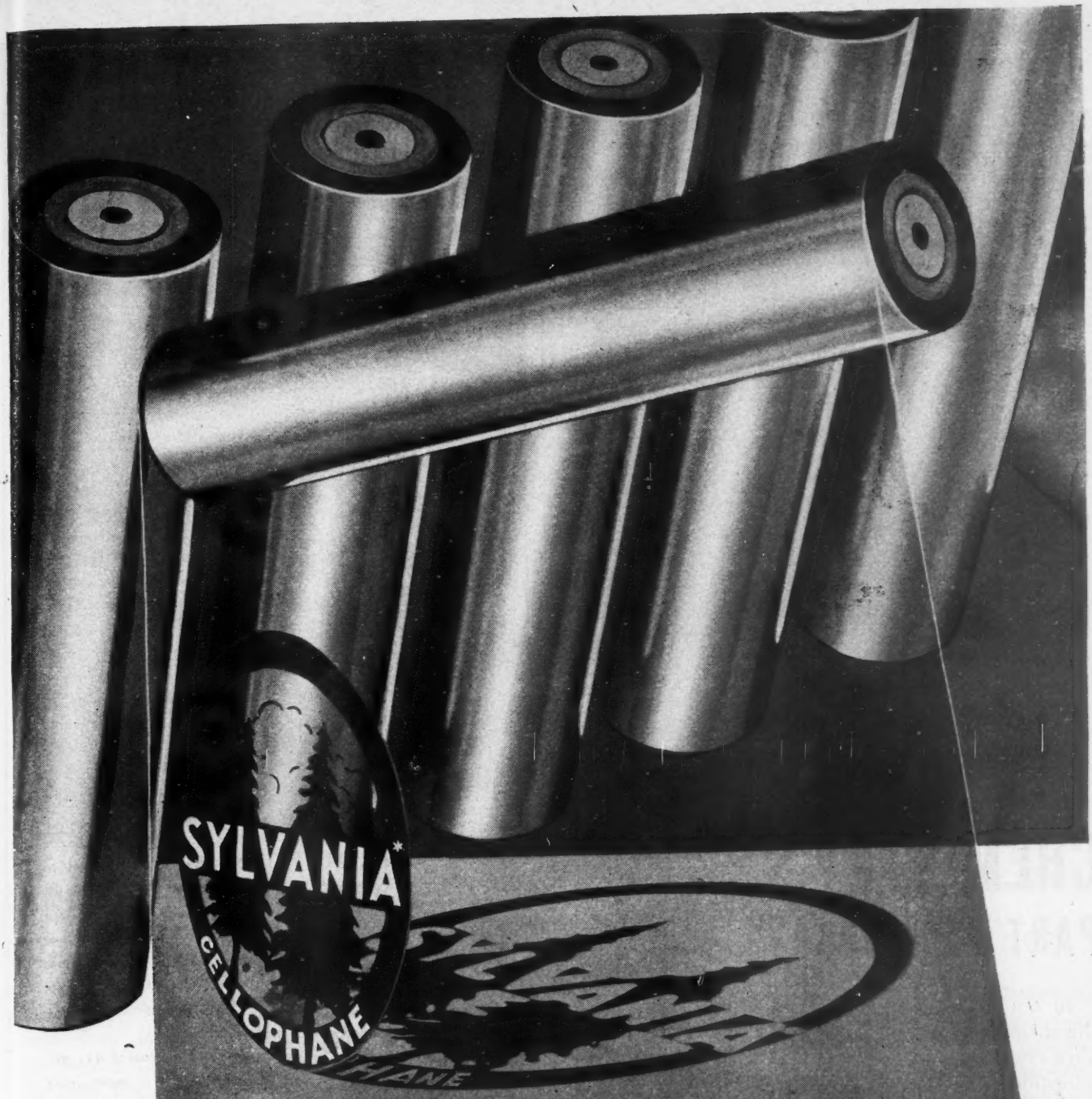
ARMY E NAVY

BUFFALO FORGE COMPANY

152 Mortimer St. Buffalo, N. Y.

Branch Engineering Offices in Principal Cities

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



Specifications stipulate that it must be:

Thin . . Tough . . Transparent . . Moisture-proof . . Gas-proof . . Heat sealable . . Non tacky . . Flexible at low temperatures.

Sylvania Cellophane*

(Quality's Best Attire)

—Meets these specifications perfectly!

Some if not all of these characteristics are the ones you take advantage of when you use Sylvania Cellophane.

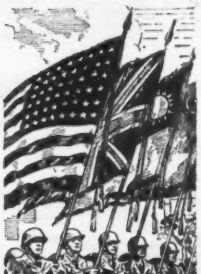
SYLVANIA INDUSTRIAL CORPORATION

General Sales Office: 122 East 42nd Street, New York 17, N. Y.

Works and Principal Office: Fredericksburg, Virginia

*TRADE MARK REG. U. S. PAT. OFF.

CHEMISTRY'S PART IN VICTORY



In *ten* thousand and one ways, the chemist is bringing the day of Victory closer and closer. Through multiplied production of military explosives . . . through discoveries of new processes aiding the food industry . . . *chemistry* is speeding the complete mobilization of our war machine and the nation's needs to keep it running.

Spencer's contribution in this achievement lies in the field of optical science and in supplying instruments of many types indispensable to the world of chemistry.

Optical instruments are so vital to war and public health that the nation's needs absorb practically all of Spencer's greatly increased production.

ARMY E NAVY

Spencer LENS COMPANY

BUFFALO, NEW YORK

SCIENTIFIC INSTRUMENT DIVISION OF AMERICAN OPTICAL COMPANY

WHAT MAKES A MAILING CLICK?

Advertising men agree — the list is more than half the story.

McGraw-Hill Mailing Lists, used by leading manufacturers and industrial service organizations, direct your advertising and sales promotional efforts to key purchasing power. They offer thorough horizontal and vertical coverage of major markets, including new personnel and plants. Selections may be made to fit your own special requirements.

New names are added to every McGraw-Hill list daily. List revisions are made on a twenty-four hour basis. And all names are guaranteed accurate within two per cent.

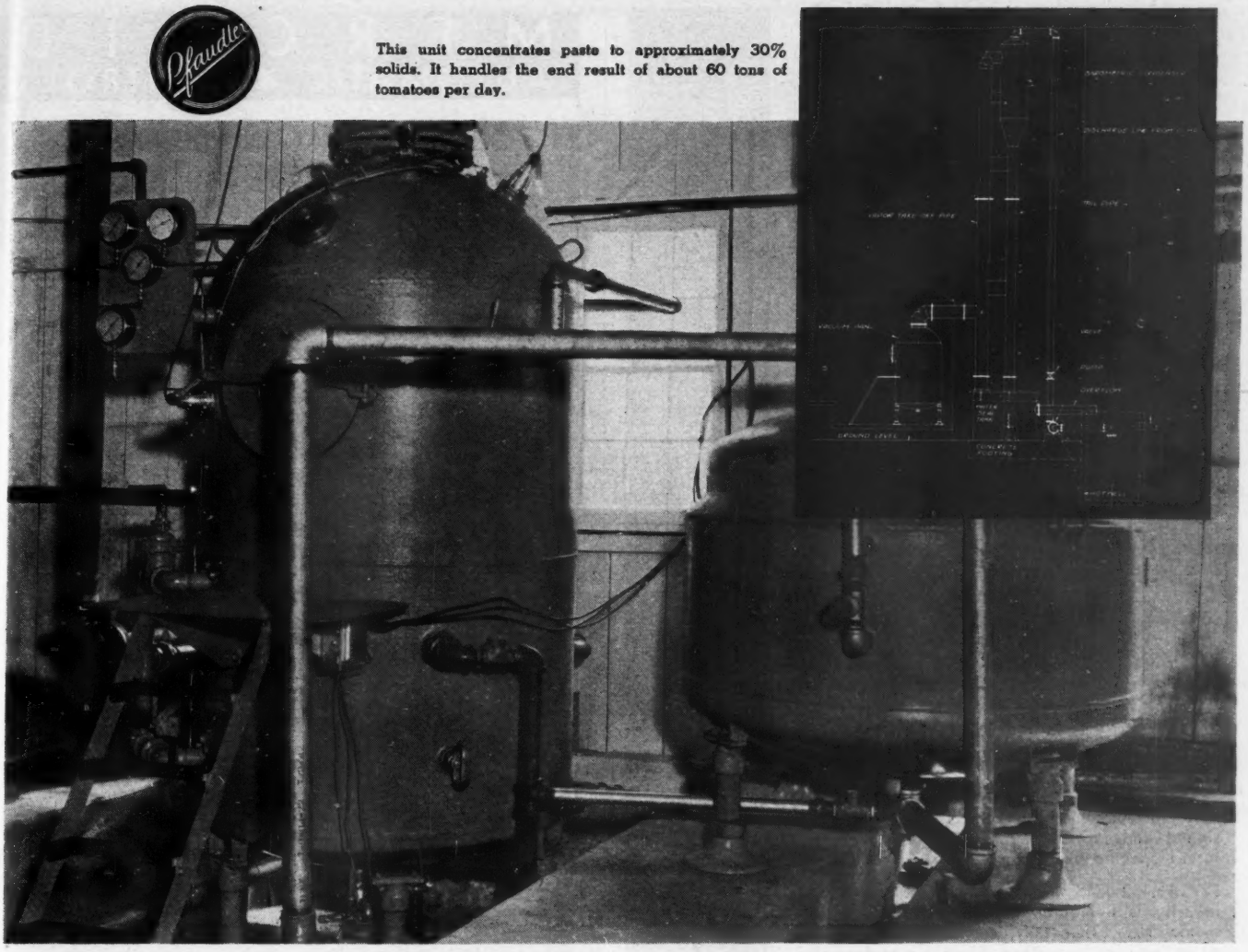
In view of present day difficulties in maintaining your own mailing lists, this efficient personalized service is particularly important in securing the comprehensive market coverage you need and want. Ask for more detailed information today. You'll probably be surprised at the low over-all cost and the tested effectiveness of these hand-picked selections.

DIRECT MAIL DIVISION

McGraw-Hill Publishing Company, Inc.

330 WEST 42nd ST. NEW YORK, N.Y.

This unit concentrates paste to approximately 30% solids. It handles the end result of about 60 tons of tomatoes per day.



Engineering vacuum processing equipment is our business
Bring your problems to PFAUDLER

When the Cedarville Canning Company of Cedarville, New Jersey, came to Pfaudler for a vacuum processing unit to make tomato paste, they asked that we plan the entire assembly. This we were glad to do, since our engineering department's many years of vacuum food processing experience is available to all food processors.

The result is a Pfaudler planned and executed installation complete from the original blueprint to the last pipe joint. In operating efficiency, in convenience and in the quality of the finished product, the plant incorporates all of the latest features of vacuum processing. That means maximum volume with minimum of equipment and manpower.

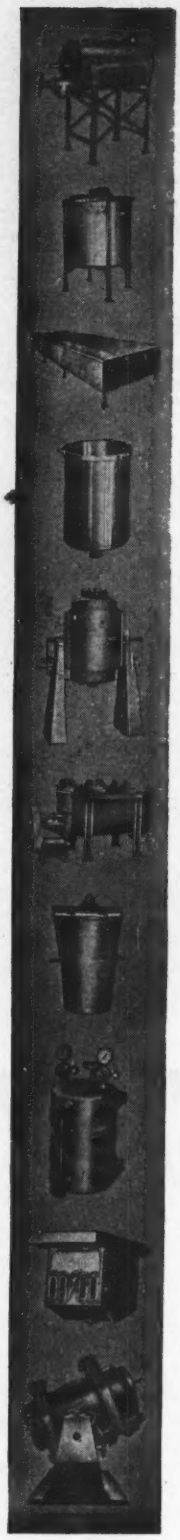
The glass-lined steel jacketed pre-heater raises the temperature of the concentrate to approximately 190°F. It is then pumped to the vacuum pan, which operates on the batch system. Actual concentration takes place at a temperature of about 125°F. This preserves natural color and flavor to a marked degree. The result is a premium product.

Pfaudler's wide experience in vacuum concentrating has been especially valuable to those companies which have been entering the field for the first time. Since few food companies maintain an engineering staff conversant with all phases of vacuum processing, we will gladly supply the information necessary to establish a successful concentrating unit.

Vacuum Concentrators for Jams, Jellies and Preserves
Pfaudler Vacuum Pans are widely used for processing jams, jellies and preserves for here again natural color, flavor and shape are retained to a remarkable degree. With a Pfaudler Vacuum Pan, it is possible to maintain extremely accurate control of total solids—an important factor in packing concentrates or in meeting state or national regulations.

P F A U D L E R

THE PFAUDLER CO., Rochester 4, N. Y. Branch Offices: 330 West 42nd St., New York 18, N. Y.; 1442 Conway Bldg., Chicago 2, Ill.; 1325 Howard St., San Francisco 3, Calif.; 455 Paul Brown Bldg., St. Louis, Mo.; 7310 Woodward Ave., Detroit 2, Mich.; 1318-1st Nat'l Bank Bldg., Cincinnati 2, O.; 1228 Commercial Trust Bldg., Philadelphia 2, Pa.; 751 Little Bldg., Boston 16, Mass. 1034 Washington Bldg., Washington 5, D. C.



Increased Labor Shortages Double The Value of Your Equipment

Reliable equipment becomes twice as important during labor shortages. There must be no layoffs or loss of time.

That is why the food industry turns to dependable, specially-built KOVENIZED equipment, designed and fabricated to meet each manufacturer's specific demands.

For over 50 years, KOVEN has provided the food industry with high-quality, individualized equipment. Now, when the industry's changes necessitate new or converted pieces, manufacturers rely, as before, on KOVEN'S vast fabricating facilities.

Call or write for a KOVEN representative today. A consultation obligates you in no way.

Among the many KOVEN products are:

- Stainless Steel
- Monel Metal Fabricator
- Pails, Special Heavy
- Pans, All Types, All Metals
- Sinks, Scullery and Factory
- Tables, Galvanized or Monel
- Boxes, Tote, Waste Cans
- Chemical Apparatus
- Aluminum Sheet Fabrication
- Coils and Pipe Bands
- Copper Sheet Fabrication
- Galvanizing Work
- Mixers, All Kinds
- Tanks, all Types, all Metals
- Kettles, All Types, All Metals

WATERFILM Industrial Heating Boilers

PLANTS:
Jersey City, N. J. Dover, N. J.

L. O. KOVEN & BRO. INC.

154 Ogden Avenue
Jersey City, N. J.

MERCOID
AUTOMATIC ★ CONTROLS

FOR REFRIGERATION AND VARIOUS FOOD PROCESSING APPLICATIONS

Mercoid DA Pressure or Temperature Controls for direct or remote mounting, have the outside double adjustment feature, which greatly simplifies setting the operating range, plainly indicated on a visible dial.

Mercoid Liquid Level and Float Controls available for various applications.

Mercury switches used exclusively in all Mercoid Controls, thereby assuring better control performance and longer control life.

Catalog sent upon request

DA Controls for Temperature or Pressure

Liquid Level, Low Water and Boiler Feed Water Pump Controls

Float Control

THE MERCOID CORPORATION, 4203 W. BELMONT AVE., CHICAGO 41, ILL.

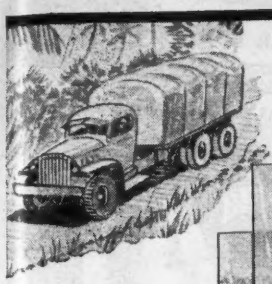
NEVER MIND THE PINK PAJAMAS, COCKY, IT'S LATER THAN YOU THINK
YOU'RE TELLING ME? ONE WHIFF OF THIS TANGLEFOOT VICTORY DIFUSOR LIQUID AND YOU'LL FILE MY WILL FOR PROBATE!

Yes, cockroaches and all other insect pests go out like a light when they come into contact with the crack- and crevice-penetrating **VICTORY DIFUSOR LIQUID** — wartime alternate for genuine **DIFUSO**. If you're fortunate enough to own a **TANGLEFOOT DIFUSOR** you can still enjoy the most effective means of pest extermination ever invented.

TANGLEFOOT
VICTORY·DIFUSOR·LIQUID

THE ONLY ALTERNATE FOR GENUINE *DIFUSO* WHICH CAN BE SAFELY USED IN THE NOW IRREPLACEABLE *DIFUSOR*

THE TANGLEFOOT CO. • GRAND RAPIDS, MICH.

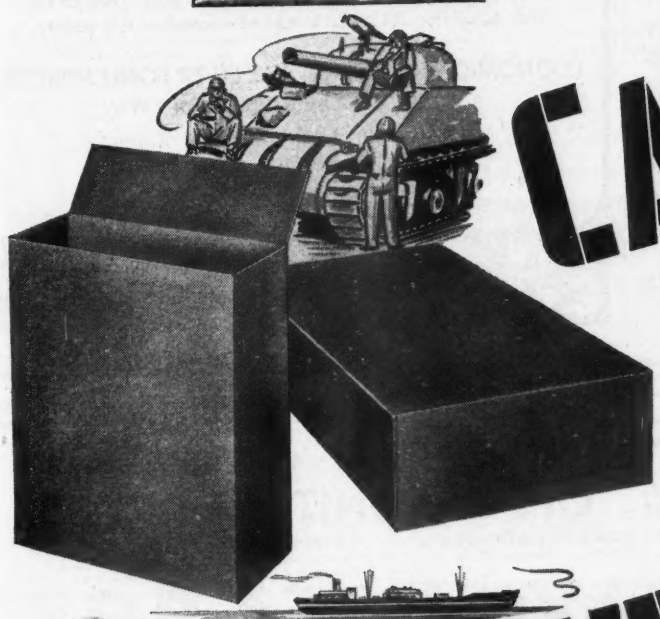


BAGS

What are your bag-packaging requirements? Menasha works in a great range of papers — single, laminated and coated sheets. A number of today's best-known war foods are going safely overseas in Menasha bags.

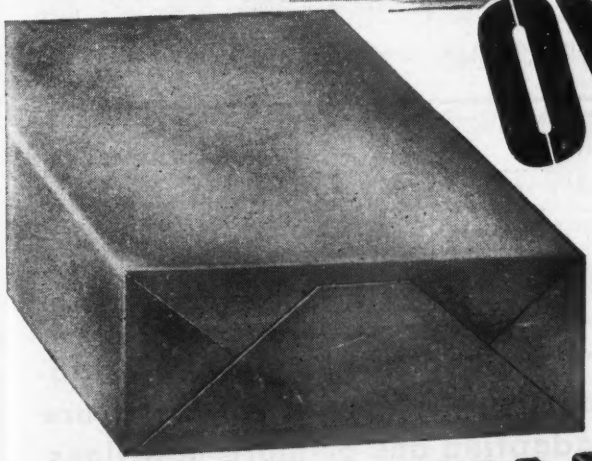
CARTONS

And your carton requirements? Protection against gain or loss of moisture, against sifting, grease penetration and insect infestation are "built-in" properties of millions of Menasha war goods cartons.



OVER-WRAPS

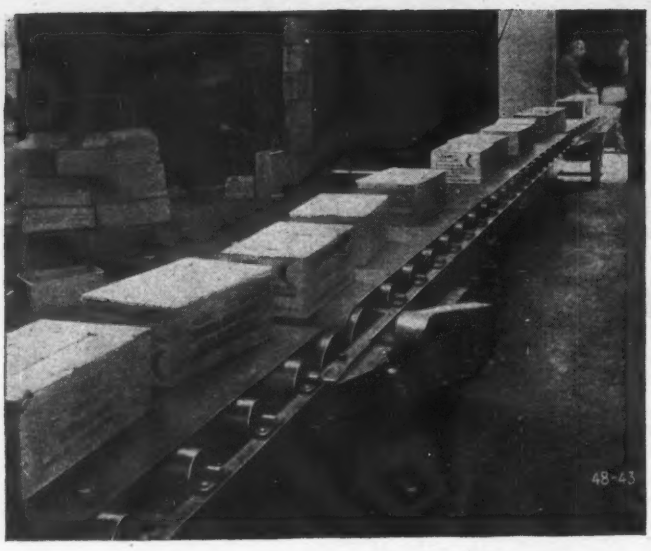
Over-wrapping fits readily into production. The required degree of protection and proper resistance to handling can be "built-in" to the single and laminated over-wraps made by Menasha.



THE MENASHA PRODUCTS CO.
Division of Marathon Paper Mills Co.
MENASHA, WISCONSIN

MENASHA PRODUCTS

CARTONS, LINERS
BAGS AND OVERWRAPS



PORTABLE sectional belt conveyors are ideal for handling boxes, crates, packages, parts, etc., in warehousing and shipping . . . are proving themselves on hundreds of jobs in the present emergency where speed is important. For top performance . . . industry specifies Jeffrey.

THE JEFFREY MANUFACTURING CO.

927-99 North Fourth Street — Columbus, Ohio

Baltimore, Birmingham, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Harlan, Houston, Huntington, W. Va., Milwaukee, New York, Philadelphia, Pittsburgh, St. Louis, Salt Lake City, Scranton

Jeffrey Manufacturing Co., Ltd. of Canada. Head Office & Works: Montreal. Branch Offices: Toronto, Calgary, Vancouver.

NEW LOW PRICE Now in Effect

LITERATURE & SAMPLE Sent on Request

ROCCAL

TRADE MARK REG. U.S. PAT. OFF.

Brand of Benzyl-Trialkonium-Chloride

GERMICIDE—SANITIZING AGENT FOR FOOD-HANDLING PLANTS

THE regular use of ROCCAL is suggested to produce *sweet, clean* and *properly sanitized* Food Handling Equipment and Storage Areas.

ROCCAL imparts no taste or odor when properly used as a sanitizing agent, and is no more corrosive to metal and rubber than ordinary water. Due to its low toxicity, ROCCAL can be used with safety.

ECONOMICAL TO USE—STABLE OVER LONG PERIODS

1 OUNCE ROCCAL GOES A LONG WAY

As a Sanitizer—1 oz. to 5 gallons of water
As a Spray —1 oz. to 1 gallon of water
For Mopping—1 oz. to 2 gallons of water

WINTHROP

Industrial Division
WINTHROP CHEMICAL COMPANY, INC.
170 VARICK STREET, NEW YORK 13, N. Y.

WANTED CHEMICAL ENGINEERS

Vegetable oil processing plant in southwest desires to expand its technical and supervisory personnel. Men with chemical engineering education and experience needed for process development and production. Immediate opportunity for administrative and technical positions.

P-183, Food Industries
330 West 42nd St., New York, 18, N. Y.

SEARCHLIGHT SECTION

EMPLOYMENT : BUSINESS : **OPPORTUNITIES** : EQUIPMENT : USED OR RESALE

UNDISPLAYED—RATE PER WORD

10 cents a word, minimum charge $2.00 an insertion.

Positions Wanted (full or part time salaried employment only ½ the above rates.

Box Numbers in care of any of our New York, Chicago or San Francisco offices count 10 words. No additional charge for forwarding replies.

Discount of 10% for payment in advance on 4 consecutive insertions of undisplayed advertisements.

DISPLAYED—RATE PER INCH

The advertising rate is $6.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

NEW ADVERTISEMENTS

must be received by 10 A. M., October 20th for the November issue subject to limitations of space available.

POSITIONS VACANT

SUPERINTENDENT: Well established food plant affords excellent opportunities for aggressive man with knowledge of fruit packing. Permanent position, excellent salary. State age, draft status, experience in detail first letter. P-187, Food Industries, 330 W. 42nd St., New York 18, N. Y.

MAINTENANCE FOREMAN: With detailed experience on fruit canning equipment. Eastern food manufacturer offers permanent position with wonderful salary opportunities. In first letter give age, list of previous employers, draft status. P-188, Food Industries, 330 W. 42nd St., New York 18, N. Y.

GROWING FOOD MANUFACTURER desires executive with supervision and production experience. Must have technical training and knowledge of candy cooking, a real future for the right man. P-202, Food Industries, 330 W. 42nd St., New York 18, N. Y.

CANDY MAKER—Challenging opportunity for candy maker with originality and ideas. Wide experience, knowledge of technique of making all types of candy, and aptitude for development work are essential qualifications. Send full statement of experience, products and process you have developed. Salary commensurate with ability. P-203, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

CONFECTIONERY CHEMIST—Unusual opportunity for experienced confectionery chemist to work in cooperation with candy maker in developing new candy ingredients. Essential qualifications: originality, ideas, desire to acquire valuable experience and personal advancement. Salary commensurate with ability. P-204, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS WANTED

FOOD TECHNOLOGIST with six years experience in supervision of production and control of food products is seeking a change. Will consider permanent position with progressive organization. PW-205, Food Industries, 330 W. 42nd St., New York 18, N. Y.

POSITIONS WANTED

THOROUGH KNOWLEDGE manufacture of genuine and artificial flavoring extracts, aromas, fruit juices, stabilizers; bakers', confectioners' soda fountain and institutional supplies and specialties. Can match, improve and work up new items, instruct salesman. Location immaterial. PW-207, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

Manufacturers of food products with established national distributing organization are interested in adopting one or more new lines.

Will consider employment of experienced practical food chemist with promising ideas or will take over going concern

Write

BO-200, Food Industries,
330 West 42 Street, New York 18, N. Y.

(ADDITIONAL EMPLOYMENT & BUSINESS OPPORTUNITY ADVERTISING ON PAGE 179)

Back the Attack!

BUY WAR BONDS—AND

"CONSOLIDATED"

WAR PRODUCTION EQUIPMENT

1—National Package Machine, semi-auto. Filling Machine with top and bottom sealer and wrapper.
1—Pneumatic Scale Packaging Unit.
10—Pony Mixers 8 to 80 gal. capacity.
15—Dry Powder Mixers, from 50 to 4000 lbs.
13—Edbauer, Scott, U. S. auto. Weighers and Fillers.
1—24" x 30" Vertical Retort.
2—80-qt. Century 4-speed Mixers, m.d.
2—Horizontal Steam Jacketed Mixers, 1100 gal. each.
14—Double and Single arm Mixers, jacketed and unjacketed, up to 500 gal. cap.
1—28"x60" double drum Atmospheric Dryer.
1—32"x90" Buffalo Atmospheric double drum Dryer, complete, m.d.
1—20"x48" single deck Rotex Screen.
2—Buffalo 24" Vanilla Bean Choppers.
4—World, 1—Ermold semi-auto. Labeling Machines.
1—Burt Straight Line Duplex Labeler.
2—Karl Kiefer Visco Filling Machines.
1—Karl Kiefer 18-spout Rotary Vacuum Filler.
1—#7 Sweetland filter, 27 copper leaves, 3" c.c.
6—Filter Press P & F; Recessed; to 42" Square.
1—Pneumatic Scale Can Capping Machine complete with conveyors, m.d.
2—World Rotary Automatic Labeling Machines.
2—Aluminum Jack, Agit. Stills, 275 gal. and 350 gal.
8—DeLaval and Sharples Super Centrifuges.
1—Stokes 500 gal. Copper Jacketed agitated Vacuum Pan.
2—Mechanical 4x9' Lard Rolls, m.d.
17—Copper, Glass Lined, Kettles and Vacuum Pans, up to 550 gal. capacity.
4—#432 Rotex Sifters, triple deck 40"x84", complete, m.d.
2—Schutz-O'Neil Pulverizers.
3—K.K. & U.S. Rotary bottle Rinsers, m.d.
1—5x35' Louisville Steam Tube Dryer.
1—Elgin 12-spout Rotary Piston Filler, S.S.
12—Copper Tanks to 7000 gal.
1—Johnson T & B Sealer Unit.
2—2"x2" Bronze Rotary Pumps, m.d.
1—U.S. Brightwood Box Machine.

● *Send for "Consolidated News" listing complete stock.*

We buy and sell from a Single Item to a Complete Plant

CONSOLIDATED PRODUCTS CO., Inc.

Office: 13-17 PARK ROW N. Y. Shops: 335 DOREMUS AVE., NEWARK

Buy With Confidence — "Consolidated"

A RARE OPPORTUNITY:

To Do Your Own

SPRAY DRYING!

(CHEMICALS AND ALLIED PRODUCTS)

● Are you interested in Spray Drying and related Processing in Food or Chemical Production or Research? Stainless Steel Spray Dryer, with complete equipment (refrigerator, oil furnace, high pressure pumps, blowers, sifter, etc.). Capacity 2,000 lbs. of water evaporation per hour. Located in Jersey City, N. J., in 6-story building with ample floor space for auxiliary operations.

This plant has processed a wide variety of food and chemical products during the past few years, i.e., eggs, milk, coconut, sugars, bead soaps, chemical detergents. These and many other research and production runs attest to its flexibility. Experienced technical aid available if desired.

SPRAY DRYING PLANT

offered

FOR SALE

for

WARTIME PRODUCTION

or

POSTWAR RESEARCH

For Full Details Write

BO. 199, Food Industries
330 W. 42 St., New York 18, N. Y.

POSITIONS WANTED
(Continued from preceding page)

PRODUCTION EXECUTIVE, chemist, experienced in plant management, production schedules, control, costs, in dehydrated and concentrated food line. Prior experience in pharmaceutical tablet, liquid, ampule, vitamin production and control. Resourceful, pusher. Successful achievement in meeting tough schedules on government contracts. Age 33. 3A. Desires lasting connection in war work with post-war future. Salary $5000.00. PW-206, Food Industries 330 W. 42nd St., New York 18, N. Y.

FOR SALE

FOR SALE—Send list of used 1½ in. Tinned Copper Sanitary Pipe-Fittings-Valves. Very cheap. Black & White Corporation, 574 West 130th St., N. Y. 27, N. Y.

WANTED

WANTED: Noodle machinery. State age, make, serial number, and price. W-208, Food Industries, 330 W. 42nd St., New York 18, N. Y.

SALESMAN WANTED

EXPERIENCED, ENERGETIC, SALESMANAGER required for introduction of a new vitamin product; must have ample experience in the vitamin field and very good connections in the pharmaceutical and food industries; must be highly qualified and capable; state qualifications, draft status and salary expected. SW-209, Food Industries, 330 W. 42nd St., New York 18, N. Y.

REPRESENTATIVE AVAILABLE

MANUFACTURERS' AGENT covering Washington, Oregon, Idaho wishes to take on new lines. Now calling on wholesale and retail trade, Army and Navy. Covering priority and non-priority accounts. Can give your line good representation in this territory on commission basis. Write William Haas & Co., Terminal Bldg., Seattle, Wash.

PRIME **LOANS** TO
CORPORATIONS—Unsecured
INDIVIDUALS—Collateralized
LARGE Sums—LOW annual rates.
COLLATERAL DISCOUNT CORP.
Graybar Bldg.—New York City

WANTED
FOOD PRODUCTS
We will buy available dehydrated vegetables, meat and milk products and concentrated fruit juices. Edible government rejects wanted. State quantity and price.
International Foodcraft Corp.
63 Whipple St. Brooklyn 6, N. Y.

WANTED

2—Tablet Machines: 3—Filters.
2—Dry Powder Mixers, with or without Sifters.
2—Rotex Screens; 1—Packaging Machine; 1—Glass Lined Kettle; Stainless Steel, Monel, Copper or Aluminum Jacketed Kettle and Vacuum Pan.

W-132, Food Industries, 330 W. 42nd St., N. Y. C.

WANTED
MIXER
Good used steam jacketed horizontal mixer, 200 to 300 gallons, trough and ends, and blades, machined to do clean scraping.
W-201, Food Industries
520 North Michigan Ave., Chicago 11, Ill.

Miller Wrapping and Sealing Machine
Having changed our method of operation offer at reasonable price this fine machine. Model MPPT17. From sheets wraps and heat seals 700 packages per hour. Chromium Finish, Fine Condition.
HOTEL BAR BUTTER CO.
365 Greenwich St., New York

FREEZER
Tuthill 5-gallon counter Freezer. No compressor or cabinet. $150. Good condition.
Black and White Corporation,
574 West 130th St. N. Y. 27, N. Y.

UNION Rebuilt Machinery Established 1912

Rebuilt Guaranteed Machinery

SPECIAL Just Received

1—Pneumatic Scale 20 spout vacuum type filling machines.

1—Johnson Automatic lining and setting up machine, top sealer and interconnecting conveyor

In Stock . . . Ready For Immediate Delivery

ALL OFFERING SUBJECT PRIOR SALE!

Wire Collect For Prices & Details!

Pneumatic Scale Co. Top Sealer and Wax Liner.

48" Copper Vacuum Pan, jacketed, complete with condenser, vacuum pump, etc., also 20 to 300 gal. sizes.

World Semi-Automatic Bottle and Jar Labeler.

Ermold Bottle Labeling Machines, motor driven.

Werner & Pfleiderer, 2,500 gal., double arm jacketed Storage and Mixing Tanks.

U. S. Bottlers 10 spout Model C-10 Filling Machine, 4 to 16 oz. cap.

850 gal. capacity Steam Jacketed Single Action Vertical Mixing Tank.

PACKAGING AND CARTONING EQUIPMENT

Including cartoning units, filling and wrapping machines—all types, makes and sizes in stock.

We Pay Cash For Single Machines Or Entire Plants

EVERY MACHINE REBUILT TO UNION'S STANDARD OF PERFECTION

UNION STANDARD EQUIPMENT CO.

318-22 LAFAYETTE STREET
NEW YORK, N. Y.

★ SELECTED BUYS from the West Coast

Section No. 1.

A-B Cooker & Cooler for #10 cans, Cooker 400 cans, Cooler 100 cans.
A-B Cooker & Cooler for #2½ cans, Cooker 832 cans, Cooler 260 cans.
Berger & Carter Cooker & Cooler for #2½, Cooker 1008 cans, Cooler 280 cans.
Burt Labeler for #2 & #2½ cans.
Worthington Steam Pump 10 x 6 x 10.
Worthington Dupl 6 x 4 x 6 Steam Pump.
American Marsh 5¼ x 4¾ x 5 Pump.
Merry-Go-Round Conveyor, pan type.
Boilers, High Pressure 320 & 200 HP.
Urshel Continuous Peeler, rebuilt.
American Peeling Machine, 75 lbs. batch.

Section No. 2.

3—600 Gal. Glass Lined Tanks.
2—Hoepner Automatic Scales for dry products, auger and scale types.
Sprague Sells Juice Filler, #10 cans.
Charlotte Colloid Mills, St Steel.
Eppenbach Colloid Mill, St Steel, 3 HP.
U.S. Piston Type Filler, for jam, etc.
75 Gal. Copper Jacketed Kettle, upright.
100 Gal. Copper Jacktd. Kettle, upright.
7 Copper Jacketed Tilt Kettles, 10 Gal.
2—50 Gal. Copper Jacketed Tilt Kettles.
Sterling Dicer Model 1-D, pulley drive.
Jay Bee Cracker Jack Hammer Mill.
Peerless Rotary Exhaust Box, #1 to #3.

★ ★

We Buy and Sell
Single items to complete Plants

For Dependability with Economy

MECO MACHINERY AND EQUIPMENT CO.

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2—M&S Universal Filling Machines.
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1—10 GPH. Barnstead Water Still.
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12—Dough Mixers, 8 to 300 gal., jacketed, and plain, single and double arm
1—Shriver 32" x 32" Filter Press, 30 chambers
2—Sweetland Filters, No. 5 and 7
3—Oliver Rotary Filters, 5'x6', 5'x8'
5—Raymond Mills, No. 0000 to No. 3
8—Hammer Mills, Williams, Gruendler
5—Mead Mills, Nos. 1, 2, 3
18—Pebble Mills, Lab. to 300 gal.
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3—Paste Fillers, Stokes, Colton
2—Can Fillers, Buffalo, ½ to 5 gals.
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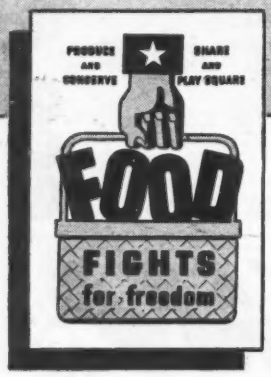
★ AMERICA NEEDS YOUR HELP! ★

FOOD FIGHTS FOR FREEDOM

PROGRAM

SPONSORED BY THE U. S. WAR FOOD ADMINISTRATION



As War Food Administrator of the United States, with a profound awareness of the food job that confronts each and every one of us, I here and now urge every member of the food industry of America to enlist in the *Food Fights For Freedom* program — to take an active part in it — to give freely your support.

MARVIN H. JONES, U. S. WAR FOOD ADMINISTRATOR

What Is The Program?

The *Food Fights For Freedom* program is an official promotion of the U. S. War Food Administration. Its purpose is to reach every individual American — to make all aware of the fact that food is a war material of first importance. Every facility of communication will be employed to inform fully everyone everywhere of the need to safeguard our precious food resources.

Why Is This Program Needed?

America does not have enough food today — nor will it have enough in the months ahead — to satisfy *all* the demands. And demands for our food will increase with every victory — not diminish — making even greater inroads on our food supply in the months to come. This does not mean that we will go hungry. There will be enough food to provide adequate diets here at home — if every American is made to understand the situation and is galvanized into action to *produce more, conserve more, waste less,* and *share fairly* our food supply.

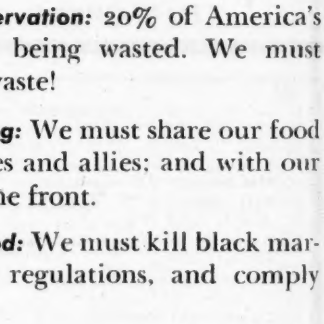
What Are The Objectives?

The all-important objectives of the *Food Fights For Freedom program* are:

1. ***To increase food production:*** We must put every employable acre in America to work.
2. ***To increase food conservation:*** 20% of America's food supply is now being wasted. We must sharply reduce this waste!
3. ***To increase food sharing:*** We must share our food with our armed forces and allies; and with our neighbors on the home front.
4. ***To play square with food:*** We must kill black markets, observe ration regulations, and comply with ceiling prices.

How You Can Cooperate!

No matter in what branch of the food industry you operate your support is vitally needed. You can help America avert a food crisis! How? Get your copy of the official booklet which is being widely distributed, "HOW THE FOOD INDUSTRY CAN SUPPORT OUR GOVERNMENT'S *FOOD FIGHTS FOR FREEDOM* PROGRAM." This booklet gives you all the facts, tells you how to get official posters and other materials *free*. Write today to: U. S. War Food Administration, Department of Agriculture, Room 249W, Administration Building, Washington, 25, D. C.



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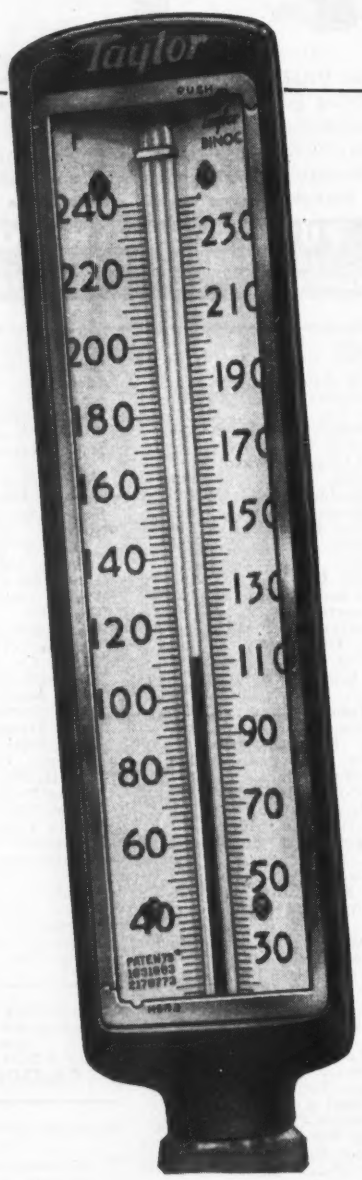
Why is a thermometer like a book?



Because unless it's easy to read, it doesn't get read.

This new improved Taylor Thermometer is as easy to read as a best seller. It invites frequent and more accurate reading, too. The new one-piece case is shallower. The triple-lens BINOC tubing stands out even more vividly, with a wider range of vision than before.

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Available in ranges of 170° to 270° for retorts and 120° to 220° for blanchers. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Instruments for indicating, recording, and controlling temperature, pressure, humidity, flow, and liquid level.*

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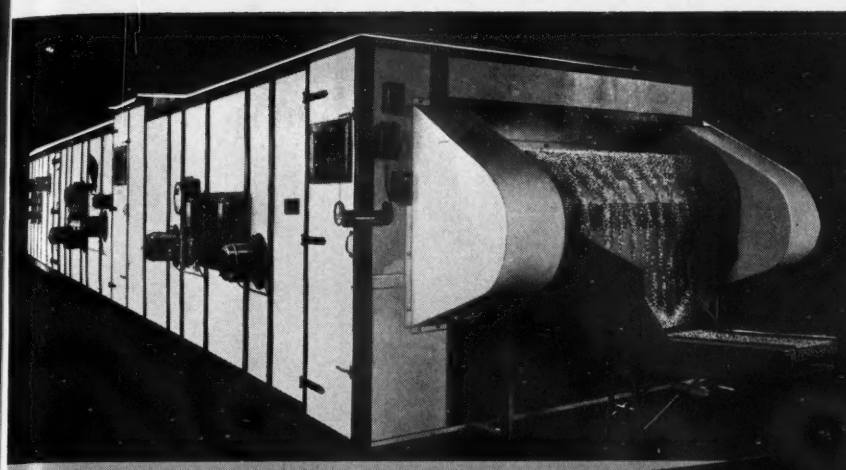

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The PROCTOR Continuous Conveyor Dehydrator operates continuously in a minimum of floor space and with a minimum of supervision. Its continuous operation and need for relatively little labor makes this the system best suited where high production and low operating costs are prime requirements.

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PROCTOR & SCHWARTZ · Inc · Philadelphia

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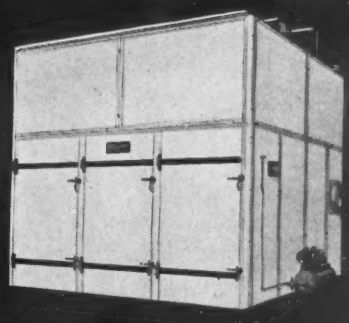
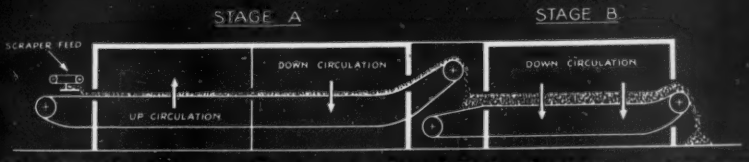
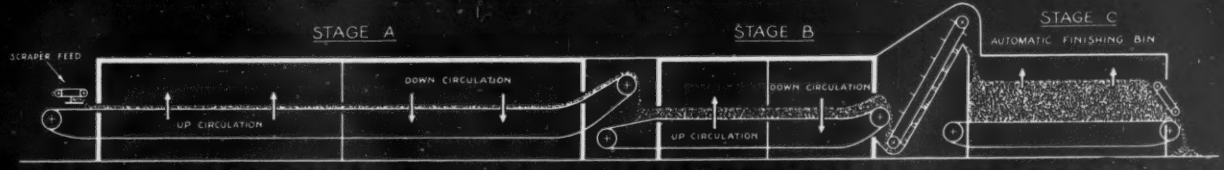
Where production requirements are somewhat lower, and time, labor and costs not such an urgent consideration, the PROCTOR Tray system will adequately fill the need. Controlled temperatures, compact heating units, highly effective insulation are features which attest that this machine conforms in every way to the highest PROCTOR standards.



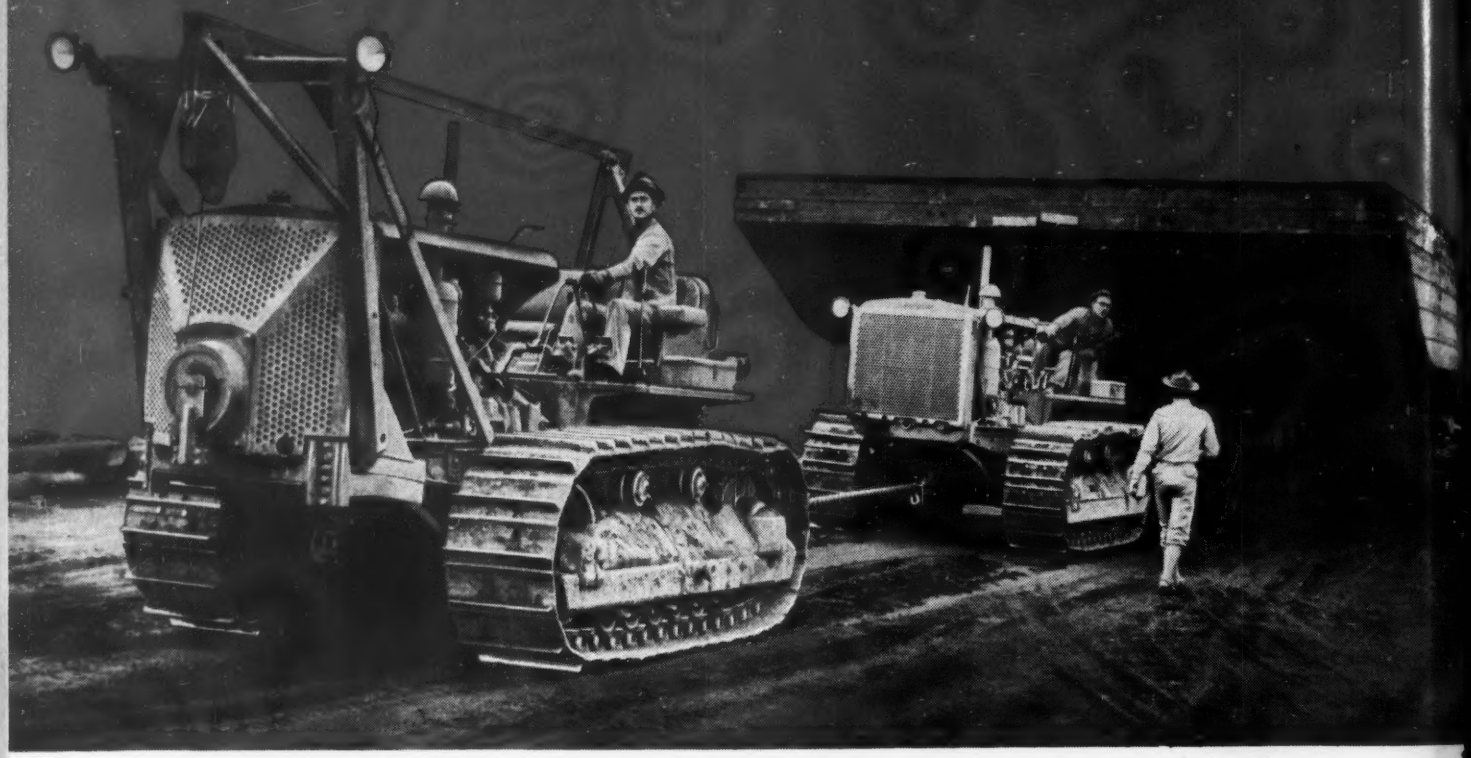


Two-Stage PROCTOR Continuous Conveyor Food Dehydrator . . . known as A B Type



Three-Stage PROCTOR Continuous Conveyor Food Dehydrator . . . known as A B C Type

OVERLAND
...to Avoid the Rapids



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